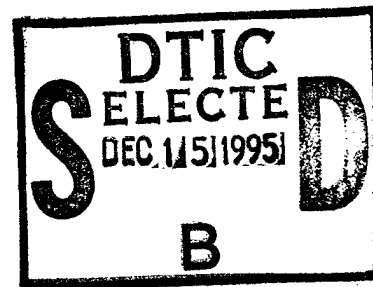


IDA DOCUMENT D-1754

THE 1995 IDA COST RESEARCH SYMPOSIUM

Stephen J. Balut, *Project Leader*

August 1995



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*Prepared for*  
Office of the Director (Program Analysis and Evaluation)

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INSTITUTE FOR DEFENSE ANALYSES  
1801 N. Beauregard Street, Alexandria, Virginia 22311-1772

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INSTITUTE FOR DEFENSE ANALYSES

Independent Research Program

*and*

Contract DASW01 94 C 0054

Task T-Q7-1138

**DTIC QUALITY INSPECTED**

## PREFACE

This document was prepared by the Cost Analysis and Research Division of the Institute for Defense Analyses (IDA) as part of a project that is jointly sponsored by IDA's Independent Research Program and the Office of the Director, Program Analysis and Evaluation (PA&E), in the Office of the Secretary of Defense (OSD). The document contains summaries of ongoing cost research tasks at selected government offices, Federally Funded Research and Development Centers (FFRDCs), and Military Universities. These projects were discussed at a meeting held at IDA on 25 May 1995.

The purpose of the document is to make available the material it contains for the use and convenience of those who participated in the meeting, and for other purposes deemed appropriate by the Chairman, OSD Cost Analysis Improvement Group. The material has not been evaluated, analyzed, nor subjected to formal IDA review.

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## **A. INTRODUCTION**

On 25 May 1995, representatives from selected offices and organizations that sponsor and conduct defense cost research met at a symposium at the Institute for Defense Analyses (IDA) to discuss and exchange information on their current research programs. The symposium was jointly sponsored by IDA and the Cost Analysis Improvement Group (CAIG) in the Office of the Secretary of Defense (OSD). Before the meeting, the representatives were asked to prepare summaries of each cost research study in progress or planned at their offices and organizations. This document catalogs those summaries.

## **B. BACKGROUND**

Several Department of Defense (DoD) offices conduct and sponsor research into methods for estimating and monitoring the costs of defense systems and forces. Such efforts improve the technical capabilities of the DoD to forecast future costs in support of planning, programming, budgeting, and acquisition decisions. The CAIG leads the department in improving capabilities in the cost area. IDA supports the CAIG and other offices in these efforts. One example of such support was IDA's initiation in 1989 of an annual defense cost research symposium. This symposium facilitates the exchange of research findings, leads to avoidance of costly duplication of effort, and allows for more informed and coordinated cost research planning among the DoD offices, Federally Funded Research and Development Centers (FFRDCs), and Military Universities that independently sponsor cost research.

The charter of the CAIG [1] requires an annual review of the plans of all DoD Components for performing or sponsoring cost research. It also requires development of a six-year plan for DoD cost research that allocates resources to the highest priority, avoids duplication of effort, and facilitates sharing of results among the DoD Components. Further, the CAIG is to make available to all interested DoD Components a data base describing completed, ongoing, and planned cost research projects.

The 1995 IDA Cost Research Symposium helped the CAIG fulfill a portion of these responsibilities. During the symposium, the cost research activities of DoD Components were reviewed and arrangements were made among participants for the exchange of research findings, data, and reports. Each year, IDA produces a catalog of the ongoing cost research activities discussed at the symposium. (This document is an example; References [2 through 7] contain similar information from previous years'

symposia.) These documents provide information that can be valuable to DoD Components and FFRDCs when making research planning and resource allocation decisions.

### C. ABOUT THE SYMPOSIUM

Selected offices and organizations were invited to participate in the 1995 symposium. The invitation list was prepared jointly by IDA and representatives of the OSD CAIG. Participation included preparation of research project summaries and attendance at the symposium. Those offices and organizations that accepted the invitations and contributed project summaries are listed in Table 1. The abbreviations and ordering of the offices and organizations shown in Table 1 are used throughout this document.

**Table 1. Participants in the IDA Cost Research Symposium**

Office/Organization	Abbreviation	Director <sup>a</sup>
Office of the Director, Program Analysis and Evaluation	PA&E	Dr. David McNicol
Army Cost and Economic Analysis Center	CEAC	Mr. Robert Young
Naval Center for Cost Analysis	NCA	Mr. Jack Smuck
Air Force Cost Analysis Agency	AFCAA	Col. Gordon Kage
Army Aviation and Troop Command	ATCOM	Mr. Mark Malone
Army Missile Command	AMC	Dr. Pauline Cason
Army Strategic Defense Command	ASDC	Mr. Jack Calvert
Army Tank and Automotive Command	ATAC	Mr. Russ Feury
Ballistic Missile Defense Organization	BMDO	Lt. Col. James Sierchio
Naval Air Systems Command	NAVAIR	Mr. Bob Patterson
Naval Sea Systems Command	NAVSEA	Mr. Michael Hammes
Air Force Material Command/Aeronautical Systems Center	ASC/FMC	Mr. Bert Pahren
Air Force Space and Missile Systems Center	AFSMC	Mr. Hansen
Air Force Human Systems Center	HSC	Ms. Betty West
RAND Corporation	RAND	Dr. Fred Timson
MITRE Corporation	MITRE	Mr. George Kreisel
Logistics Management Institute	LMI	Mr. Milton Margolis
Aerospace Corporation	Aerospace	Dr. Stephen Book
Air Force Institute of Technology	AFIT/LA	Dr. Roland Kankey
Defense Systems Management College	DSMC	Mr. Cleve Pillifant
Center for Naval Analyses	CNA	Dr. Henry Eskew
Institute for Defense Analyses	IDA	Dr. Stephen Balut

<sup>a</sup> Though their actual titles vary, these individuals are referred to as "directors" in this document.

The symposium was held in the spring to correspond with the CAIG's schedule for updating the DoD's Six-Year Cost Research Plan [8 and 9]. Budget decisions related to such studies are usually made during the summer. These decisions will be better informed because they will be made in light of the information disseminated at the symposium and contained in this document.

The agenda for the one-day symposium differed substantially from prior years' symposia. The Cost Centers/Agencies of the Military Departments presented the status of the consolidated research programs of all participating activities in their respective Military Departments. This was followed by a summary of the status of cost research being performed by organizations outside the Military Departments (e.g., OSD, Federally Funded Research and Development Centers, Universities). These presentations highlighted research in key areas of the DoD Six-Year Cost Research Plan. Other presentations included a keynote address by the Chairman of the OSD CAIG, Dr. McNicol, a special presentation by Professor William P. Rogerson on "Economic Incentives and the Defense Procurement Process," and advice from Dr. Vance Gordon on updating the Six-Year Cost Research Plan. Speakers and their topics are listed in Table 2.

**Table 2. Agenda**

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<b>Welcome</b>
Dr. Stephen J. Balut, <i>Institute for Defense Analyses</i>
<b>Keynote Address</b>
Dr. David McNicol, <i>Cost Analysis Improvement Group</i>
<b>Status of Army Cost Research</b>
Mr. Robert Young, <i>Army Cost and Economic Analysis Center</i>
<b>Status of Navy Cost Research</b>
Mr. Jack Smuck, <i>Naval Center for Cost Analysis</i>
<b>Status of Air Force Cost Research</b>
Mr. John Dorsett, <i>Air Force Cost Analysis Agency</i>
<b>Status of Other Defense Cost Research</b>
Dr. Vance Gordon, <i>Cost Analysis Improvement Group</i>
<b>Economic Incentives and the Defense Procurement Process</b>
Professor William P. Rogerson, <i>Northwestern University</i>
<b>FY 1996-2001 Cost Research Plan Development</b>
Dr. Vance Gordon, <i>Cost Analysis Improvement Group</i>

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## **D. USING THE CATALOG**

This document was designed to facilitate a search for information on a specific topic. The following explains how the document's pertinent sections can be used:

- Table 3, Keyword Assignments. In the table, the rows represent keywords and the columns represent offices and organizations. The number at the intersection of a row and column is the number of studies by the office or organization (column) that have the keyword (row) associated with them.
- Appendix A, Study Titles. This appendix lists the study titles for tasks that are summarized in Appendix B. The titles, grouped according to the office or organization performing the study, appear in the order in which they were submitted to IDA.
- Appendix B, Summaries. This appendix is divided into sections, one for each office and organization that contributed project summaries. Most sections have two parts. The first part is a description of the office or organization (name, location, director, size, etc.). (In some sections this description does not appear because it was not provided.) Following that are summaries of each research task in progress or planned at that office or organization at the time of the symposium. Near the end of each summary is a list of keywords assigned to the task by the director of the office or organization. (In several cases, the author modified the keywords for consistency.)

Finding tasks on a specific topic is accomplished as follows: (1) scan the appropriate row in Table 3 to identify the offices and organizations that are conducting studies on the topic; (2) scan the list of study titles for those offices and organizations in Appendix A; and (3) refer to the appropriate summaries in Appendix B.

## **E. HOW TASKS COMPARE TO THE PLAN**

Some readers may be interested in how the tasks in this catalog align with the topics listed in the latest version of the Six-Year Cost Research Plan. Tables 4 and 5 have been included for this purpose. Table 4 lists the titles of research themes first presented in January 1993 [8] and later modified by the Interim DoD Six-Year Cost Research Plan, FY 1994-99 [9].

Table 4 includes full titles of topics. To conserve space, only numeral-letter-number codes are used in Table 5. The assignment of tasks to research themes (i.e., Table 5) were made by the directors of the participating offices and organizations.

Table 3. Keyword Assignments

Perspective	PA&E	CEAC	NCA	AFCAA	ATCOM	ATAC	SSDC	BMDO	NAVAIR	NAVSEA	ASCFMC	AFSMC	HSC	RAND	MTRE	LMI	Aerospace	AFT/LA	DSMC	CNA	IDA	Total
Industry	5	—	11	2	—	—	—	—	3	8	—	1	3	1	2	—	1	1	2	—	4	44
Government	13	14	58	59	1	2	4	6	40	9	2	9	3	3	5	4	10	9	3	2	24	290
Context																						
Estimating	8	11	40	46	1	2	3	4	39	18	2	9	3	2	1	2	8	5	1	2	11	218
Analysis	7	11	29	54	—	1	—	4	31	18	—	—	3	1	4	2	3	6	2	1	12	189
Reviewing/Monitoring	—	—	2	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	3	8
Policy	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	1	—	4	9
Programming	6	—	—	1	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	1	2	12
Budgeting	1	1	—	—	—	—	—	—	1	—	—	—	—	—	1	2	2	—	—	—	2	10
Object																						
Forces	7	2	—	1	—	—	—	—	—	1	—	—	—	2	—	1	—	—	—	1	6	21
Weapon Systems	1	3	23	—	—	—	2	2	6	—	2	—	3	—	2	1	—	3	1	—	4	53
Aircraft	2	1	8	8	—	—	—	—	17	—	1	—	—	2	—	1	—	—	—	1	3	44
Helicopters	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	3
Missiles	—	1	12	4	—	—	3	5	10	—	—	1	—	—	—	—	—	—	—	—	3	39
Ships	1	—	11	—	—	—	—	—	—	21	—	—	—	—	—	—	—	—	—	—	—	33
Land Vehicles	—	3	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5
Space Systems	—	—	—	24	—	—	1	1	—	—	—	9	—	—	—	—	8	—	—	—	3	46
Airframe	1	—	—	2	—	—	—	1	—	—	—	—	—	1	—	—	—	1	—	—	—	6
Propulsion	—	—	—	—	—	—	1	1	3	—	—	—	—	—	—	—	—	—	—	—	—	5
Electronics/Avionics	—	3	16	8	—	—	2	3	11	3	1	1	—	1	1	—	—	—	—	—	1	51
Spares/Logistics	—	1	—	19	—	—	1	—	6	—	—	—	—	—	1	1	—	4	1	—	—	34
Facilities	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	—	1	4
Infrastructure	3	—	—	—	—	—	—	—	—	—	—	—	—	—	3	2	—	—	—	—	7	15
Manpower/Personnel	—	1	—	—	—	—	—	—	1	—	—	—	—	—	1	3	1	1	—	—	3	11
Stage																						
Concept Development	—	—	—	—	—	—	—	—	—	3	1	—	—	—	1	—	2	1	—	—	—	8
Demonstration/Validation	—	—	2	—	—	—	2	2	—	2	1	—	—	—	—	—	1	—	—	—	—	10
EMD	1	8	23	7	—	—	3	2	16	1	1	7	—	2	—	—	3	3	1	—	6	84
Production	4	6	36	7	—	—	3	6	19	12	1	7	—	2	—	—	6	—	—	—	6	115
Test and Evaluation	—	—	1	2	—	1	—	1	3	—	—	—	—	—	—	—	—	—	—	—	2	10
Operations and Support	3	3	8	3	1	—	1	—	6	5	—	1	3	1	1	3	—	1	—	—	6	46
Retirement and Demilitarization	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Life Cycle	4	1	9	35	—	—	—	—	12	3	1	1	3	1	4	1	4	2	1	1	10	93
Focus																						
Labor	1	2	7	7	—	—	—	—	2	12	1	1	3	2	—	1	—	1	—	—	2	42
Material	1	2	6	7	—	—	—	—	5	12	1	1	3	2	—	—	—	—	—	—	—	40
Overhead/Indirect	4	—	3	3	—	—	—	—	2	9	—	—	3	1	—	1	1	4	—	—	1	32
Engineering	2	1	2	—	—	—	—	—	2	12	1	—	—	—	1	—	2	—	—	—	2	25

Table 3. Keyword Assignments (Continued)

Focus (continued)	PA&E	CEAC	NCA	AFCAA	ATCOM	ATAC	SSDC	BMDO	NAVVAIR	NAVSEA	ASCE/CMC	AFSMC	HSC	RAND	MITRE	LMI	Aerospace	AFT/LA	DSMC	CNA	IDA	Total
Manufacturing	3	1	2	—	—	—	—	—	6	7	1	—	—	—	—	—	4	2	—	—	1	27
CPR/CCDR	1	8	3	—	—	—	3	2	2	—	—	—	—	—	—	—	—	—	—	—	1	20
WBS	2	2	12	1	—	—	—	2	—	4	—	8	—	1	—	—	—	—	—	—	4	36
Fixed Costs	3	—	—	—	—	—	—	—	2	—	—	—	—	—	1	1	—	—	—	—	2	9
Variable Costs	3	—	1	—	—	—	—	—	2	—	—	—	—	—	2	2	—	—	—	—	3	13
Production Rate	—	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	—	—	—	3
Acquisition Strategy	3	—	3	—	—	—	—	—	3	2	—	—	—	—	2	—	7	1	—	—	4	25
Automation	—	—	—	—	—	—	—	—	4	—	—	—	—	—	1	—	—	—	—	—	4	9
Advanced Technology	1	—	—	3	—	1	—	—	5	—	—	—	—	—	1	—	—	—	—	—	—	11
Risk/Uncertainty	1	—	5	—	—	—	—	—	—	1	—	1	—	—	2	—	2	—	1	1	2	16
Training	—	1	1	—	—	—	—	—	—	—	—	—	—	—	1	2	1	—	—	—	2	8
Readiness	—	—	1	9	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	5	16
Reliability	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	2
Sustainability	—	—	1	—	—	—	—	—	2	1	—	—	—	—	1	1	—	—	—	—	1	7
Integration	—	—	6	—	—	—	—	—	1	1	—	—	—	—	1	—	—	—	1	—	1	11
Modification	—	1	4	1	—	—	—	—	2	—	—	1	—	—	—	—	1	—	—	—	—	10
Security	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Environment	—	—	1	—	—	—	—	—	1	1	—	1	3	—	—	1	—	1	—	—	1	10
Schedule	—	—	5	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	—	3	10
Size	—	—	1	3	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	6
Approach																						
Data Collection	6	12	40	51	—	—	4	6	40	11	1	7	3	1	1	4	6	4	1	1	7	206
Survey	2	—	7	—	—	—	—	2	20	5	—	2	—	—	—	—	—	—	—	—	2	40
Case Study	3	2	5	—	—	—	—	—	1	3	—	—	—	—	—	—	3	1	2	—	4	24
Mathematical Modeling	6	—	6	39	—	1	2	2	—	6	1	3	—	1	2	2	3	2	—	1	8	85
Economic Analysis	4	—	2	—	—	—	—	—	—	1	—	—	3	—	5	—	—	1	1	—	8	25
Cost/Production Function	—	—	1	—	—	—	—	2	—	4	—	—	—	—	—	—	2	—	—	—	1	10
Time Series	—	—	1	—	—	—	—	—	—	—	—	—	—	—	2	1	—	—	—	—	—	4
Statistics/Regression	2	—	10	38	—	—	—	2	—	4	—	5	—	1	—	1	4	1	—	1	4	73
Product																						
Data Base	6	8	30	51	—	—	4	3	23	7	1	5	3	2	1	1	3	—	1	—	11	160
Review	1	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	8
Method	2	3	12	1	—	—	—	2	13	6	—	5	—	1	3	—	3	—	—	—	7	58
Mathematical Model	—	—	9	10	—	1	—	—	5	5	1	2	—	—	2	1	1	2	—	—	2	41
Computer Model	7	2	—	19	1	—	—	—	11	6	—	—	—	2	2	2	5	3	—	1	5	66
Expert System	1	—	2	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	6
Cost Progress Curve	—	—	2	—	—	—	1	—	1	—	—	—	—	—	—	—	1	—	—	—	—	5
CER	—	5	12	23	—	—	3	4	14	8	—	4	—	—	—	—	3	—	—	—	2	78
Study	8	3	31	6	—	1	—	3	26	12	—	2	—	1	2	1	2	6	2	1	12	119

**Table 4. Structure for Planning Research**

- 
- I. Research themes for special emphasis
    - A. Cost-estimating techniques for the new acquisition environment
      - 1. Selective upgrading of existing systems
      - 2. Selective low-rate procurements
      - 3. Roll-over plus
      - 4. Silver bullet procurements
    - B. Cost estimation for major defense acquisition programs (MDAPs) in the engineering and manufacturing development (EMD) phase
      - 1. Methods for highlighting dependency on new technologies that either will become significant cost items in their own right or may set the pace of the program
      - 2. Techniques for determining technical and schedule uncertainties in ways that facilitate rational evaluation of their cost impact
    - C. Techniques for estimating environmental cost throughout an MDAPs life cycle
    - D. Improved contractor cost data
  - II. Maintenance-of-the-toolbox themes
    - A. Sustain the effectiveness of established tools
      - 1. Updates to incorporate recent experience
      - 2. Improvements to broaden scope or enhance methods
    - B. Incorporate new analysis techniques
    - C. Make progress on difficult problems that previously have eluded solution
    - D. Explore new ideas to establish their suitability for improving cost analysis
- 

The totals displayed in the far right column of Table 5 show much more research in the “maintenance-of-the-toolbox themes” area, Category II, than in the “research themes for special emphasis” area, Category I. The most effort is being expended to “sustain the effectiveness of established tools,” Category II.A. In addition, most offices are attempting to “incorporate new analysis techniques,” Category II.B, and “make progress on difficult problems that previously have eluded solution,” Category II.C. No research was reported being done on either “roll-over plus,” Category I.A.3, or “silver bullet procurements,” Category I.A.4.



Table 5. Research Categories

	PA&E	CEAC	NCA	AFCAA	ATCOM	ATAC	SSDC	BMDO	NAVAIR	NAVSEA	ASC/EMC	AFSMC	HSC	RAND	MITRE	LMI	Aerospace	AFT/LA	DSMC	CNA	IDA	Total
I	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
I.A	—	—	12	10	—	—	—	—	—	2	—	—	—	—	1	—	5	—	—	—	1	31
I.A.1	3	—	2	1	—	—	—	1	—	—	1	—	—	—	1	—	—	1	—	2	12	
I.A.2	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—	2	
I.A.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
I.A.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
I.B	—	—	1	27	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	
I.B.1	—	1	2	—	—	—	—	—	—	3	—	—	—	—	—	—	3	1	—	—	1	
I.B.2	—	—	6	—	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—	—	—	
I.C	1	—	1	1	—	—	—	—	—	1	—	1	3	—	—	—	—	1	—	—	4	
I.D	1	—	1	11	—	—	—	—	—	—	—	—	—	1	1	—	—	1	—	—	1	
II	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
II.A	—	—	3	40	1	—	—	—	23	1	1	—	—	—	—	—	3	—	—	—	1	
II.A.1	7	10	12	1	—	—	4	2	1	2	—	1	3	3	1	—	2	1	—	—	4	
II.A.2	8	7	17	4	—	—	—	3	6	7	1	6	3	2	4	1	2	4	—	2	8	
II.B	3	—	20	23	—	—	—	—	1	6	1	1	—	—	2	1	4	4	1	2	4	
II.B.2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
II.C	4	—	28	1	—	—	—	—	8	5	—	2	—	1	2	1	2	5	—	—	6	
II.D	—	1	21	13	—	—	—	—	2	6	1	—	—	1	3	—	5	5	—	—	2	

## STUDY TITLES

### *Office of the Director, Program Analysis and Evaluation*

PA&E-1	Private Shipbuilder Overhead Costs
PA&E-2	Assessment of CCDD System
PA&E-3	Financial Databases of Defense Manufacturers
PA&E-4	Demilitarization and Disposal Costs of Missile Systems
PA&E-5	Understanding the Sources of Cost Growth in Weapon Systems
PA&E-6	Force Structure and Support Infrastructure Costing for Program Analysis and Evaluation
PA&E-7	Improving Infrastructure Resource Analysis Through Better Management Accounting
PA&E-8	Economic Drivers of Defense Overhead Costs
PA&E-9	Estimating the Costs of Non-Developmental Airlift Aircraft (NDAA)
PA&E-10	Recapitalizing the Force
PA&E-11	Force Costing
PA&E-12	FYDP Tracking and Analysis System
PA&E-13	Data Preparation Program Conversions
PA&E-14	National Defense Program Costs
PA&E-15	Planning-Defense Economic Impact Modeling System (P-DEIMS)
PA&E-16	Software Cost Model Evaluation
PA&E-17	Estimation of Medical-Specific Inflation Indices

### *Army Cost and Economic Analysis Center*

CEAC-1	Aircraft Data Base and Methodology Enhancement
CEAC-2	Wheel and Track Vehicle Module of USACEAC Standard Data Base Architecture
CEAC-3	Missile Module of USACEAC Standard Data Base Architecture
CEAC-4	Communications/Electronics Module of USACEAC Standard Data Base Architecture
CEAC-5	The Army Force Cost System (FORCES)
CEAC-6	Operating and Support Management Information System (OSMIS)
CEAC-7	Millimeter Wave and Other Advanced Seekers
CEAC-8	Update Army Manpower Cost System (AMCOS) Data Base, Model
CEAC-9	ACEIT/PC-ACDB Training and Support for Army Cost Estimating Requirements
CEAC-10	OMA Factors Study
CEAC-11	The Development of Cost Factors for Data, Initial Consumables and Initial Repairables

CEAC-12	Cost Factors for Communications and Electronics Programs
CEAC-13	AGS EMD Cost Categorization Crosswalk
CEAC-14	AGS EMD Contract Cost Overrun Analysis

### *Naval Center for Cost Analysis*

NCA-1	Ship Upgrade Cost Model
NCA-2	Ship System Modernization Database
NCA-3	Surface Ships Construction Cost Model Update
NCA-4	Research Investigations of COTS, Ruggedized and MILSPEC Hardware
NCA-5	Affordability Through Commonality Cost Factors
NCA-6	Ship System Integration Cost Database/Model
NCA-7	Electronics System Technical Database
NCA-8	Electronics Systems Procurement Hardware Cost Estimating Methodology
NCA-9	Ship Conversion Cost Database/Model
NCA-10	Ship System Modernization Cost Database
NCA-11	Ship Upgrade Cost Model Update
NCA-12	Impact of COTS Hardware Usage on Contractor and Government In-House Support Cost
NCA-13	The Application of Artificial Intelligence to Cost Estimating
NCA-14	Incorporating Technical Risk in Cost Estimates
NCA-15	The Cost Impact of CAD/CAM on Weapon System Engineering Design, Development and Manufacturing
NCA-16	Estimating Weapon System Modification Kit and Integration Cost
NCA-17	An Alternative to Learning Curve Theory
NCA-18	Financial Forecasting for Military Contractors and the Defense Industry
NCA-19	Developing Correct Correlations Among Cost Element Estimates
NCA-20	The Cost Impact of Contractor Teaming on Defense Contracts
NCA-21	Cost Element Probability Distribution Profiles
NCA-22	Time Phased Maintenance Costs for Shipboard Electronics
NCA-23	COTS vs. Ruggedized COTS vs. MILSPEC Equipment Cost Database and Estimating Methodology
NCA-24	Software Development Cost Estimating Database and Methodology
NCA-25	Factors Impacting Software Development Cost
NCA-26	Aircraft Avionics and Missile System Installation Cost Study
NCA-27	Aircraft Test and Evaluation Cost Model
NCA-28	Initial Support and Initial Spares Cost Model
NCA-29	Airframe Advanced Structure Material Cost Model
NCA-30	Update of Naval Fixed- and Rotary-Wing Aircraft Operating and Support (O&S) Cost Model
NCA-31	Methodology for Estimating Costs of Major Aircraft Modifications
NCA-32	Reengineering Aircraft Engine Cost Estimating Relationships (CERs)
NCA-33	The Stealth Factor
NCA-34	Naval Aircraft Development to Production Transition Cost
NCA-35	Aircraft System Integration Cost Data Base/Model

NCA-36	Develop a Technical Data Base to Support O&S Costing
NCA-37	Establish an Unmanned Aerial Vehicle (UAV) Data Base
NCA-38	Missile Guidance Component Cost Data
NCA-39	Cost Analysis Requirements Document (CARD) Template
NCA-40	Missile Technical Characteristics and Cost Information
NCA-41	Certain Support Costs
NCA-42	Production Cost Benchmark
NCA-43	Platform Integration
NCA-44	Government In-House Cost Study for Air-Launched Missiles
NCA-45	Matching Obligations to Expenditures: Equality Restricted Least Squares as the Method of First Resort
NCA-46	MK 41 Vertical Launch System Cost Analysis
NCA-47	Analysis of the Relationship Between Development and Production Costs and Comparisons with Other Related Step-up/Step-down Studies
NCA-48	REVIC Calibration for Embedded, Ada and Non-Ada Projects
NCA-49	VAMOSC Comparative Analysis
NCA-50	Electronics Initial Spares Costs
NCA-51	Integration of Navy VAMOSC Data Base
NCA-52	Compilation of Detailed Navy VAMOSC Maintenance Data
NCA-53	Use of a Partial Adjustment Model for Explaining Changes in Overhead Rates
NCA-54	Development of a Life-Cycle Cost Analysis Course
NCA-55	Update of NCA's Z-Score Model
NCA-56	Update of NCA's Uncertainty Model
NCA-57	Cost Implications of Various Acquisition Strategies
NCA-58	Investigation of Methods for Generating EACs
NCA-59	Development of Computer Hardware Price Indices and CERs for the Projection of New Computer Technology Capabilities
NCA-60	Empirical Validation of Software Cost Estimation Models
NCA-61	Cost Implications of Schedule Slippages in Software Development Programs
NCA-62	Estimating Acquisition Reform Savings
NCA-63	Environmental Life Cycle Costs for Major Navy Weapon Systems
NCA-64	Streamlining the ICE/CCA Process
NCA-65	Software Cost and Technical Glossary
NCA-66	Software Technology and Life Cycle Primer
NCA-67	Software Cost Tracking Database

#### ***Air Force Cost Analysis Agency***

AFCAA-1	Avionics Systems Data Collection
AFCAA-2	Composite/Exotic Materials Database
AFCAA-3	O&S Cost Estimating Relationships (CERs) Development for Support Equipment
AFCAA-4	O&S Cost Estimating Relationships (CERs) Development for AVPOL

AFCAA-5	Aircraft Engine Database
AFCAA-6	Composite Material Support Cost Database
AFCAA-7	Lean Manufacturing & New Material Concepts
AFCAA-8	Aircraft Modification Programs Study
AFCAA-9	Aircraft Database Study Follow-On
AFCAA-10	O&S Cost Estimating Relationships (CERs) Development for DLRs, PDM and Engine Overhaul
AFCAA-11	O&S Cost Estimating Relationships (CERs) Development for BMS and Sustaining Engineering
AFCAA-12	C3 Platform Integration Data Base
AFCAA-13	C3 Hardware Maintenance Data Base
AFCAA-14	SEPM Data Base & CERs
AFCAA-15	C3 Depot Level Repairables (DLR) Model
AFCAA-16	SEPM Estimating Handbook
AFCAA-17	Munitions Seeker Data Collection
AFCAA-18	Missiles/Munitions ACDB Update
AFCAA-19	Missiles/Munitions SE/PM CER Development
AFCAA-20	Munitions/Seeker CER Development
AFCAA-21	Missiles/Munitions ST&E CER Development
AFCAA-22	Missiles/Munitions O&S CER Update
AFCAA-23	Software "Growth" Feasibility Study
AFCAA-24	Software Functional-Based Size Estimating Method - Domain and Functional Software Taxonomy
AFCAA-25	Software Size Estimating Methods Study
AFCAA-26	Neural Network Analysis of Historic Software Development Data
AFCAA-27	Software Estimating Process Study - Generic Estimating Question Set
AFCAA-28	Software Data Collection
AFCAA-29	Expert Systems for Software Estimating
AFCAA-30	SoftEST Software Estimating Tool
AFCAA-31	Software Performance Measurement System
AFCAA-32	Activity-Based Software Estimating Methodology
AFCAA-33	Post-Deployment Software Support (PDSS) Estimating Methods Study
AFCAA-34	Space System Database Consolidation (Phase I)
AFCAA-35	Launch Vehicle Cost Model (LVCM) Expansion
AFCAA-36	Communications Payload Data Collection and Database Development
AFCAA-37	Sensor Payload Data Collection and Database Development
AFCAA-38	Space System Database Consolidation (Phase II)
AFCAA-39	Streamlined Acquisition Cost Study
AFCAA-40	Satellite Storage Cost
AFCAA-41	Booster/Payload Interface Standard
AFCAA-42	Space System Database Consolidation (Phase III)
AFCAA-43	Common Bus Data Collection
AFCAA-44	Re-Engineering Space Cost Estimating
AFCAA-45	Launch Vehicle Database Update
AFCAA-46	Business Base Impact Cost Study Follow-On

AFCAA-47	Strategic/Navigational/Weather/Crosslinks Payload Data Collection Update
AFCAA-48	New Technology Cost Study
AFCAA-49	Space-Environmental Cost Study
AFCAA-50	Wide Area Network (WAN) Database
AFCAA-51	Common Bus CER Development
AFCAA-52	Ground Segment WBS/CER Development
AFCAA-53	EHF Communication Payload Database Update
AFCAA-54	Launch Database Update 99
AFCAA-55	Space Database Update 2000
AFCAA-56	Bus Database Update 2000
AFCAA-57	Strategic/Navigational/Weather/Crosslinks Payload Data Collection
AFCAA-58	Multinational Satellite Cost Study
AFCAA-59	Bus CER Update and Development
AFCAA-60	Ground Segment Database Update

***Army Aviation and Troop Command***

ATCOM-1	Quick Turn-Around Operating and Support Costing Model
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***Army Tank and Automotive Command***

ATAC-1	Virtual Prototyping on Army Land Systems (VPALS) Benefit Cost Study
ATAC-2	Performance Affordability Assessment Model (PAAM)

***U.S. Army Space and Strategic Defense Command***

SSDC-1	Operations and Support (O&S) Cost Research, Data Collection and Factor/CER Development
SSDC-2	Attitude Control Systems (ACS)/ATM Boosters
SSDC-3	Battle Management, Command, Control and Communications (BMC3) Cost Research, Data Collection and Factor/CER Development
SSDC-4	Ground Based Radar (GBR) Cost Research

***Ballistic Missile Defense Organization***

BMDO-1	Radar Hardware Cost Estimating Relationships (CER) Data Base
BMDO-2	Missile Hardware Step Functions
BMDO-3	Missile Integration, Assembly, and Test (IA&T) Cost Methodology Improvement
BMDO-4	Endo-Atmospheric Missile Hardware Cost Estimating Relationships (CER) Database
BMDO-5	Unit Cost versus Production Rate
BMDO-6	Cost Estimating Cross Check Guide

### *Naval Air Systems Command*

NAVAIR-1	Acquisition Reform Strategy Study
NAVAIR-2	Naval Aviation Modification Model (NAMM) Data Base
NAVAIR-3	Overhead Study
NAVAIR-4	Nonrecurring Design Hours for Avionics Equipment
NAVAIR-5	Aircraft ILS and O&S Cost Model
NAVAIR-6	Line Shutdown/Restart Costs
NAVAIR-7	Historical Data Book Data Base
NAVAIR-8	Missile System Engineering/Program Management for EMD and Production
NAVAIR-9	Cost Profiles for Weapon Systems
NAVAIR-10	Update of Maurer Factor and Propulsion Data Base
NAVAIR-11	New Support Technology Impacts on ILS
NAVAIR-12	Hybrid Technology & CERs
NAVAIR-13	Cable Technology & CERs
NAVAIR-14	Display and Control Panel Cost Data Base
NAVAIR-15	Antenna Cost Data Base
NAVAIR-16	Cost Breakout
NAVAIR-17	Platform Integration and Installation Study & CERs
NAVAIR-18	CCDR Analysis Model
NAVAIR-19	Environmental Impacts on Weapon System Costs
NAVAIR-20	Make vs. Buy Decision Impacts on Airframe Production Programs
NAVAIR-21	Electronic Data Library
NAVAIR-22	Design to Cost Study
NAVAIR-23	Competition Study
NAVAIR-24	Rocket Motor Estimating Methods
NAVAIR-25	Indirect O&S Cost Database
NAVAIR-26	Test Program Set (TPS) CERs
NAVAIR-27	Mission Personnel Factors for Missiles
NAVAIR-28	Learning Curves and Rates By Commodity and Contractor
NAVAIR-29	Warranty Cost-Estimating Tools
NAVAIR-30	OPEVAL and TECHEVAL Cost-Estimating Tools/CERs
NAVAIR-31	Test Program Sets (TPS) and Test Requirement Documentation (TRD) Cost
NAVAIR-32	Missile Test and Evaluation Data Including Aircraft Integration Costs
NAVAIR-33	F/A-18 Logistics Cost Data Base
NAVAIR-34	Affordability Initiatives (JAST Supported)
NAVAIR-35	Avionics Commodity Costs (JAST Supported)
NAVAIR-36	Program Software Costs (JAST Supported)
NAVAIR-37	Operating and Support (O&S) Study (JAST Supported)
NAVAIR-38	Avionics ILS/O&S Cost Model (JAST Supported)
NAVAIR-39	Update Propulsion Cost Estimating Relationships (JAST Supported)
NAVAIR-40	Update Propulsion O&S Model (JAST Supported)

### ***Naval Sea Systems Command***

- NAVSEA-1 Product-Oriented Design and Construction (PODAC) Cost Data Collection and Analysis
- NAVSEA-2 Near-Term Prototype PODAC Cost Model
- NAVSEA-3 Shipbuilding Process Simulation Model
- NAVSEA-4 Costing Tools in Support of Parametric CAD Tools
- NAVSEA-5 Hull, Mechanical, and Electrical (HM&E) Navy Infrastructure Cost Analysis
- NAVSEA-6 ATC Operating and Support Cost Model
- NAVSEA-7 Commercial Specs versus Military Specs
- NAVSEA-8 Estimating Methodology for Detail Design Costs
- NAVSEA-9 Metrication of the U.S. Shipbuilding Industry
- NAVSEA-10 Cost Module for Sealift Ship Version of ASSET
- NAVSEA-11 Sealift Ship Operating and Support (O&S) Cost Data Collection and Analysis
- NAVSEA-12 Development of Product-Oriented Cost-Estimating Tools
- NAVSEA-13 Private Shipbuilder Overhead Costs
- NAVSEA-14 Cost Analysis of Environmental Impacts
- NAVSEA-15 Analysis of Engineering, Integration, and Support Services Costs for Ship Construction
- NAVSEA-16 LPD 17 Class Cost Model Development
- NAVSEA-17 Surface Combatant Performance-Based Life-Cycle Cost Model
- NAVSEA-18 Product-Oriented Design and Construction (PODAC) Cost Model
- NAVSEA-19 Operating and Support (O&S) Costs for Surface Navy Ships Systems
- NAVSEA-20 Dynamic Investment Balance Simulator (DIBS) (previously called Planning Under Uncertainty Computer Model)
- NAVSEA-21 Research and Development Cost-Estimating Research
- NAVSEA-22 The Ship Combat-Systems Estimating and Analysis Model
- NAVSEA-23 Fleet-Wide Cost/Benefit Assessment

### ***Air Force Materiel Command/Aeronautical Systems Center***

- ASC/FMC-1 Aeronautical Systems Center (ASC) Cost/Schedule Research Roadmap (FY95)
- ASC/FMC-2 Advanced Aircraft Cost Forecasting Model (AACFM)

### ***Air Force Space and Missile Systems Center***

- AFSMC-1 Update of ACE-IT with Unmanned Spacecraft Cost Model (USCM) 7
- AFSMC-2 Hazardous Materials Disposal Cost Study
- AFSMC-3 Software Data Base (Phase VI)
- AFSMC-4 Operations and Support (O&S) Data Base
- AFSMC-5 Risk Study
- AFSMC-6 SEER-H Calibration
- AFSMC-7 Sensor Model Update



AFSMC-8	Unmanned Spacecraft Cost Model (USCM) Update
AFSMC-9	Ground Station Cost Model

***Human Systems Center, Brooks AFB***

HSC-1	HazMat Model Cost Trade-Off Analysis Tool
HSC-2	HazMat Model Manufacturing and Maintenance Process Cost Analysis Tool
HSC-3	HazMat Model Material Cost Analysis Tool

***The RAND Corporation***

RAND-1	Projecting Defense Acquisition Spending
RAND-2	Military Aircraft Cost Data Base
RAND-3	Weapon System Cost Drivers
RAND-4	Air Force O&S and Force Cost Analysis

***MITRE Corporation***

MITRE-1	Economics of Commercial-Off-The-Shelf (COTS)
MITRE-2	Information Technology Total Cost of Ownership Model
MITRE-3	Ordinal Ranking Methods for Multicriteria Decision Making
MITRE-4	COTS Logistics and Support Strategies
MITRE-5	Software Engineering Life Cycle: A Dynamic View
MITRE-6	Forecasting PC Price Trends

***Logistics Management Institute***

LMI-1	Accrual Accounting of Post-Retirement Military Health Care Training Base Capacity To Respond to Mobilization and Reconstitution
LMI-2	Analysis of Institutional Training Resources
LMI-3	Training Installation Capability Analysis
LMI-4	Aircraft Operating and Support Cost-Estimating Relationships

***The Aerospace Corporation***

Aerospace-1	Costs of Space, Launch, and Ground Systems
Aerospace-2	Validation Testing of Commercial Risk-Analysis Software
Aerospace-3	Space Acquisition Strategy Model
Aerospace-4	Small-Satellite Cost Engineering Model
Aerospace-5	Small-Satellite Cost Study
Aerospace-6	Costs and Benefits of Adherence to MIL-SPECs and MIL-STDs
Aerospace-7	Reducing the Impact of Learning-Curve Assumptions
Aerospace-8	Ground Systems Cost Model
Aerospace-9	Concurrent Engineering as a Cost Reduction Method
Aerospace-10	Impact of Programmatics on System Costs
Aerospace-11	Bus Standardization Cost Model

## Aerospace-12 Aerospace Cost Analysis Model for Electronic Boxes

### ***Air Force Institute of Technology***

- AFIT/LA-1 Expanding the Defense Construction Supply Center (DCSC) Activity-Based Costing (ABC) Model to Include External Resource Costs
- AFIT/LA-2 Development of an Activity-Based Costing (ABC) Model for the Defense Distribution Depot Columbus (DDCO)
- AFIT/LA-3 Understanding the Implications of Activity-Based Costing for Logistics Management
- AFIT/LA-4 Applicability of an Activity-Based Cost System Within Government Service Organizations
- AFIT/LA-5 The Purpose and Development of Management Reserve Budget on Defense Contracts
- AFIT/LA-6 A Comparison of Nonlinear Estimate At Completion Methods
- AFIT/LA-7 An Analysis of Smart Bomb Alternatives Using the Analytic Hierarchy Process
- AFIT/LA-8 Hazardous Materials Life Cycle Estimation
- AFIT/LA-9 An Analysis of Self-Care at WPAFB Hospital
- AFIT/LA-10 Calibration of Five Software Cost Models to an Air Force Data Base ("Project Pentateuch")

### ***Defense Systems Management College***

- DSMC-1 Cost and Risk Analysis Research
- DSMC-2 Integrated Product Development (IPD) at the Air Force Materiel Command
- DSMC-3 Research on Ongoing Acquisition Research (ROAR)

### ***Center for Naval Analyses***

- CNA-1 Study of Procedures and Software for Assessing Uncertainty in Cost Estimates
- CNA-2 Update and Extension of Automated Cost Models

### ***Institute for Defense Analyses***

- IDA-1 Analytic Support to the Commission on Roles and Missions of the Armed Forces
- IDA-2 Integrated Schedule and Cost Model
- IDA-3 Assessing Defense Funding Supporting Readiness
- IDA-4 Cost of Defense Force Projections
- IDA-5 Migration (Tree) Diagrams and Enterprise Integration Process Documentation Support
- IDA-6 Program Risk Analysis and Management
- IDA-7 Space and Missile Systems Nuclear Hardening Costs
- IDA-8 Technical and Schedule Risk Assessments for Tactical Aircraft Programs

IDA-9	Software Environments
IDA-10	Economics of Software Reuse Repositories
IDA-11	Estimating the ROI for Software System Engineering
IDA-12	Business Process Redesign
IDA-13	Resource Analysis for Test and Evaluation
IDA-14	Resource Analysis for Acquisition Systems Protection
IDA-15	Preplanned Product Improvements and Engineering Change Proposals for Consolidated Automated Support System (CASS)
IDA-16	Improved Methodologies for Relating Flying-Hour Activity to Operational Readiness and Safety Measures
IDA-17	Tactical Air Force Deployments to Distant Areas
IDA-18	Evaluation of Uniformed Services Treatment Facilities
IDA-19	Cost Analysis Education
IDA-20	IDA Cost Research Symposium
IDA-21	Energy Management Analysis
IDA-22	Environmental Costing Resources in the Department of Defense
IDA-23	Coast Guard Models
IDA-24	Reserve Component Volunteerism
IDA-25	Methods to Assess Schedules for the Strategic Defense System
IDA-26	The Costs of Collocating Wargaming and Simulation Centers

**OFFICE OF THE DIRECTOR,  
PROGRAM ANALYSIS AND EVALUATION**

<b><i>Name</i></b>	Office of the Deputy Director (Resource Analysis) Program Analysis and Evaluation (PA&E)	
<b><i>Address</i></b>	1800 Defense Pentagon Washington, DC 20301-1800	
<b><i>Director</i></b>	David L. McNicol	
<b><i>Size</i></b>	Professional:	36
	Support:	5
	Consultants:	1
	Contract Studies:	17
<b><i>Focus</i></b>	Cost Analysis Improvement Group (CAIG) Life-Cycle Costs of Major Defense Acquisition Programs Force Structure Costing Operating and Support Costs Economic Analysis	
<b><i>Activity</i></b>	CAIG reviews and studies per year:	30–40
	POM, Budget, FYDP reviews:	As Required

**Title:** Private Shipbuilder Overhead Costs

**Summary:** The Weapon Systems Cost Analysis Division of PA&E is continually involved in both acquisition policy determination as well as the cost analysis of the effects of DoD programmatic actions on individual contractors in specific programs. While the economics profession has a well developed theory of the firm to apply to commercial markets, many of the important and unique characteristics of the defense market-place are ignored. Thus, many of the policy judgments about acquisition issues are neither grounded in adequate micro-economic theory, nor based on empirical research. Dramatic increases in defense contractor overhead costs as a general trend in the industry continue to compromise the affordability of Naval ships, weapon systems and hull mechanical and electrical ship board components. This is a continuation of a task that studies the overhead cost structure of six private ship yards to gain a better understanding of the root cause of these upward cost trends. The financial databases for the ship yards initiated in last year's study will be extended to most aspects of cost distribution and allocations in cost pools. These data will be structured to ensure consistency with earlier IDA reports on the same contractors and will be used to update the overhead statistical models. [This task appeared in the 1994 Catalog as NAVSEA-3.]

**Classification:** Unclassified, Proprietary, Business Sensitive

**Sponsor:** Weapon Systems Cost Analysis Division  
OD(PA&E)  
Room 2D310, The Pentagon  
Washington, DC 20301  
Mr. Gary Pennett (703) 695-7282

**Performer:** IDA  
1801 N. Beauregard St.  
Alexandria, VA 22311

<b>Resources:</b>	Dollars
FY 1995	340,000
FY 1996	250,000
FY 1997	250,000

***Schedule:*** Start: 1993

End: 1997

***Data Base:*** Normalized Contractor Account Pools

***Publications:*** Multiple publications including individual contractor reports.

***Category:*** II.A.1, II.A.2

***Keywords:*** Industry, Estimating, Ships, Production, Labor, Material,  
Overhead/Indirect, Engineering, Manufacturing, WBS, Data  
Collection, Mathematical Modeling, Statistics/Regression, Data  
Base, Study

**Title:** Assessment of CCDR System

**Summary:** The purpose of this task is to provide recommendations and to assist in their implementation to improve the quality and usefulness of both the data and the collection system being used by DoD to obtain Contractor Cost Data Reporting (CCDR) information. [This task appeared in the 1994 catalog as IDA-17.]

**Classification:** Unclassified

**Sponsor:** Weapon Systems Cost Analysis Division  
OD(PA&E)  
Room 2C310, The Pentagon  
Washington, DC 20301  
Mr. Gary Bliss (703) 695-7282

**Performer:** IDA  
Dr. Stephen J. Balut (703) 845-2527  
Mr. Jack Cloos (703) 845-2506

**Resources:**

	Dollars	Staff-Years
FY 92	150,000	1.0
FY 95	250,000	1.7

**Schedule:** Start: September 1992  
End: September 1996

**Data Base:** N/A

**Publications:** "Assessment of the Contractor Cost Data Reporting (CCDR) System," IDA Paper P-2964, S. Balut, J. Cloos, April 1994, Unclassified

**Category:** I.D

**Keywords:** Government, Industry, Estimating, CPR/CCDR, WBS, Survey, Case Study, Review, Computer Model, Study



**Title:** Financial Databases of Defense Manufactures

**Summary:** The Weapon Systems Cost Analysis Division of PA&E is continually involved in both acquisition policy determination as well as the cost analysis of the effects of DoD programmatic actions on individual contractors in specific programs. While the economics profession has a well developed theory of the firm to apply to commercial markets, many of the important and unique characteristics of the defense market-place are ignored. Thus, many of the policy judgments about acquisition issues are neither grounded in adequate micro-economic theory, nor based on empirical research. Dramatic increases in defense contractor overhead costs as a general trend in the industry continue to compromise the affordability of weapon systems. Between 1980 and 1989 ODP&E funded IDA collection of financial data on 12 defense contractors. The database extends through 1987 for most contractors. IDA used the data to decompose overhead into fixed and overhead components. The effort needs to be extended to update the database. The financial databases for the original contractors will be updated and extended to include most recent data available. These data will be structured to ensure consistency with earlier IDA reports on the same contractors and will be used to update the overhead statistical models. [This task appeared in the 1994 catalog as PA&E-2.]

**Classification:** Unclassified, Proprietary

**Sponsor:** Weapon Systems Cost Analysis Division  
OD(PA&E)  
Room 2D310, The Pentagon  
Washington, DC 20301  
Mr. Gary Pennett (703) 695-7282

**Performer:** IDA  
1801 N. Beauregard St.  
Alexandria, VA 22311

<b>Resources:</b>	Dollars
Study Funding FY 95	150,000
ADP Funding FY 95	100,000
ADP Funding FY 96	100,000

***Schedule:*** Start: 1994  
End: 2000

***Data Base:*** Normalized Contractor Account Pools

***Publications:*** Numerous. Company reports and studies.

***Category:*** II

***Keywords:*** Industry, Estimating, Analysis, Aircraft, Airframe, EMD,  
Production, Overhead/Indirect, Manufacturing, Fixed Costs,  
Variable Costs, Data Collection, Survey, Economic Analysis, Data  
Base

**Title:** Demilitarization and Disposal Costs of Missile Systems

**Summary:** This project is designed to construct a data base and develop a set of estimating relationships that capture the costs of demilitarizing and disposing of missile systems, primarily tactical. The need arises as a result the Cost Analysis Improvement Group's initiative to recognize the environmental costs of major defense acquisition programs while they still are in development. Planning for demilitarization and disposal has long been overshadowed by more immediate demands on program management such as the flight test program or the schedule for initial operational capability. However, experience shows that the costs of such activities can be important (chemical weapons offering the most extreme case) and need direct examination during milestone reviews. This project is organized under PA&E sponsorship to capture costs on a DoD-wide basis for a class of weapon that is used in all services; this approach avoids the duplication inherent in parallel single-service projects. The contractor will research data from a wide variety of missile systems that have undergone demilitarization and disposal, making recommendations as to how such data should be collected and recorded in the future. Once a sufficient stock of such data are accumulated, the contractor will formulate and refine statistical cost estimating relationships that analysts may use estimate the costs of demilitarization and disposal for new systems. The contractor will be required to harmonize approaches and methods with another on-going effort to estimate demilitarization and disposal costs of large, multi-engine aircraft (under the guidance of the Air Force Cost Analysis Agency).

**Classification:**

**Sponsor:** OD(PA&E), RA, OAPPD  
Room 2D278, The Pentagon  
Washington, DC 20301

Dr. Michael R. Anderberg (703) 697-0317

**Performer:** Tecolote Research, Inc.  
Huntsville, AL

***Resources:*** Dollars

FY 95	75,000
FY 96	75,000
FY 97	75,000

***Schedule:*** Start:

End:

***Data Base:*** N/A

***Publications:***

***Category:*** I.C

***Keywords:***

**Title:** Understanding the Sources of Cost Growth in Weapon Systems

**Summary:** Building on past research, the objectives are to (1) continuously update RAND's cost growth data base and (2) identify and evaluate factors affecting cost growth. [This task appeared in the 1994 catalog as RAND-3.]

**Classification:** Unclassified

**Sponsor:** OD(PA&E)

**Performer:** RAND  
Fred Timson (310) 393-0411  
Jeanne Jarvaise (202) 296-5000

**Resources:** Dollars:  
Staff-years:

**Schedule:** Start: January 1991  
End: Continuing

**Data Base:** Defense System Cost Performance Database  
Description: Cost growth histories and assorted program data on 231 weapon systems through December 1993  
Classification: Unclassified  
Automation: PC (Excel)

**Publications** "The Defense System Cost Performance Database: Cost Growth Analysis Using SARs," DRR-149-PA&E, Norton, Drezner, Jarvaise, January 1993, Unclassified (distribution of RAND drafts controlled by sponsor)

**Category:** II.A.1, II.A.2

**Keywords:** Government, Analysis, Risk/Uncertainty, Data Collection, Data Base, Study

**Title:** Force Structure and Support Infrastructure Costing for Program Analysis and Evaluation

**Summary:** The objective of this research is to design, develop, and implement an automated system for costing force structure and related changes in defense programs. The project will include recommendations for developing a centralized database within PA&E to support the costing system. [This task appeared in the 1994 catalog as RAND-4.]

**Classification:** Unclassified

**Sponsor:** OD(PA&E)

**Performer:** RAND

Adele Palmer (310) 393-0411

Manuel Carrillo (310) 393-0411

Gary Massey (310) 393-0411

Jim Bigelow (310) 393-0411

**Resources:** Dollars:

Staff-years:

**Schedule:** Start: December 1990

End: Continuing

**Data Base:**

**Publications** "The Force Structure Costing Project: An Introductory Briefing," WD-5252-PA&E, Adele Palmer, December 1990, Unclassified (distribution of RAND WDs controlled by sponsor)

**Category:** II.C

**Keywords:** Government, Estimating, Analysis, Programming, Forces, Expert System, Method, Computer Model

**Title:** Improving Infrastructure Resource Analysis Through Better Management Accounting

**Summary:** This task uses Activity Based Costing techniques to investigate the costs of the DoD infrastructure and what drives those costs . This task describes the basic accounting data now being used to compute infrastructure costs and identifies its shortfalls and better alternatives. It represents a first step in addressing infrastructure issues such as, what pricing policy should DBOF follow to lower infrastructure costs while maintaining capabilities. The maintenance depots and pricing for depot-level reparable are used as case studies. [This task appeared in the 1994 catalog as LMI-4.]

**Classification:** Unclassified

**Sponsor:** OSD(PA&E) Dr. David McNicol

**Performer:** Logistics Management Institute  
6400 Goldsboro Road  
Bethesda, MD 20817  
Mr. David Glass (703) 917-7234

**Resources:** Dollars:  
Staff-years: 2.33 man-years annually

**Schedule:** Start: June 1993  
End: 31 December 1994

**Data Base:** None

**Publications:** "Improved Management Accounting for the DoD Infrastructure," David Glass, Milt Margolis, John Wallace, Earl Wingrove  
"Management Accounting for DoD Depot Maintenance," David Glass, Milt Margolis, John Wallace  
  
On the Use of Transfer Prices Within DoD: The Case of Repair and Maintenance of Depot-Level Reparables by the Air Force, W. Rogerson.

**Category:** II.C

**Keywords:** Government, Policy, Infrastructure, Operations and Support,  
Overhead/Indirect, Case Study



**Title:** Economic Drivers of Defense Overhead Costs

**Summary:** The objective of this task is to identify the economic and regulatory factors that drive the overhead costs charged by defense firms. A theoretical model of overhead costs from an economic framework will be developed. The model will be used to analyze the relationship of economic factors and DoD regulations on contractor overhead costs under current business practices. The model will also assess how changes in DoD regulations impact the balance of economic forces.

**Classification:** Unclassified/Company Proprietary

**Sponsor:** OASD(PA&E), Room 1D311, The Pentagon  
Ms. Kristine Kolesar (202) 697-2999

**Performer:** IDA  
Dr. Thomas Frazier (703) 845-2132  
Dr. An-Jen Tia (703) 845-2448  
Dr. David Graham (703) 845-2358  
Dr. Bill Rogerson (703) 491-8484

**Resources:** Dollars: \$250,000  
Staff-years: 1.7

**Schedule:** Start: April 1995  
End: April 1996

**Data Base:** IDA's Defense Contractor Overhead Data Base  
Automation: TBD

**Publications:** TBD

**Category:** II.C

**Keywords:** Industry, Government, Analysis, Overhead/Indirect, Economic Analysis, Study

**Title:** Estimating the Costs of Non-Developmental Airlift Aircraft (NDAA)

**Summary:** The objective of this task is to acquire, collate, normalize and present cost and other engineering data that will assist the CAIG in performing its independent cost estimating function for NDAA.

**Classification:** Unclassified

**Sponsor:** OSD(PA&E), Room 2C310, The Pentagon  
Mr. Jim Dorsett (202) 697-6712

**Performer:** IDA  
Dr. J. R. Nelson (703) 845-2571

**Resources:** Dollars: \$150,000  
Staff-years: 1

**Schedule:** Start: January 1995  
End: March 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A.1, II.A.1, II.A.2

**Keywords:** Industry, Estimating, Aircraft, Production, Operations and Support, Data Collection, Data Base, Method

**Title:** Recapitalizing the Force

**Summary:** This research will determine the end-of-service life of weapon systems, estimate the costs to replace them, and estimate funds available for this purpose when needed.

**Classification:** Secret

**Sponsor:** OSD(PA&E), Room 2C281, The Pentagon  
Mr. Mark Mohler (703) 697-9141

**Performer:** IDA  
Mr. Waynard C. Devers (703) 845-2252

**Resources:**

	Dollars:	Staff-Years
FY 94	\$53,000	0.3
FY 95	\$200,000	1.2

**Schedule:** Start: July 1994  
End: March 1996

**Data Base:** Excel database on equipment inventory and age

**Publications:** TBD

**Category:** I.A.1

**Keywords:** Government, Estimating, Analysis, Programming, Forces, Weapon Systems, Life Cycle, Acquisition Strategy, Advanced Technology, Data Collection, Case Study, Study, Data Base, Computer Model

**Title:** Force Costing

**Summary:** This task supported development and implementation of improvements to the Force Cost Model of the Force Acquisition Cost System (FACS). Present funding supports only updating of currently configured model. [This task appeared in the 1994 catalog as IDA-1.]

**Classification:** Secret

**Sponsor:** OD(PA&E)  
Force and Infrastructure Cost Analysis Division  
Room 2D278, The Pentagon  
Washington, DC 20301  
Mr. Dan Barker (703) 697-4311

**Performer:** IDA  
Mr. Timothy J. Graves (703) 845-2339

**Resources:**

	Dollars:	Staff-years:
FY 1990	\$200,000	1.3
FY 1994	\$50,000	.4

**Schedule:** Start: March 1990  
End: September 1996

**Data Base:** FYDP  
Description: FYDP type data for all DoD programs to include Defense Mission Categories, Program Element, Procurement Annex Line Item.  
Automation: PC in dBASE, FoxPro, Excel, Windows, C

**Publications:** TBD

**Category:** II.A.1, II.A.2, II.B

**Keywords:** Government, Programming, Forces, Life Cycle, Acquisition Strategy, Mathematical Modeling, Computer Model

**Title:** FYDP Tracking and Analysis System

**Summary:** This task strengthens the DoD's capability to apply FYDP data when conducting analyses in support of PPBS processes through the development of a system of computer-based analytical tools. [This task appeared in the 1994 catalog as IDA-5.]

**Classification:** Secret

**Sponsor:** OD(PA&E)  
Force and Infrastructure Cost Analysis Division  
Room 2D278, The Pentagon  
Washington, DC 20301  
  
Mr. Dan Barker (703) 697-4311

**Performer:** IDA  
  
Mr. Timothy J. Graves (703) 845-2339

<b>Resources:</b>	Dollars	Staff-Years
FY 93	250,000	2
FY 94	150,000	1.2

**Schedule:** Start: July 1993  
End: September 1996

**Data Base:** FYDP  
  
Description: FYDP type data for all DoD programs to include Program Element  
  
Automation: PC in FoxPro, Visual Basic

**Publications:** TBD

**Category:** II.A.1, II.A.2, II.B

**Keywords:** Government, Programming, Forces, Life Cycle, Acquisition Strategy, Mathematical Modeling, Computer Model

**Title:** Data Preparation Program Conversions

**Summary:** This task supports the transfer of data preparation capabilities currently existing on PC and mainframe computers to the new OD(PA&E) Resource Analysis UNIX-based server/DOS-based client network. The first program capabilities to be transferred will be the Advanced Mission-Oriented Resources Display related data analysis programs. [This task appeared in the 1993 catalog as IDA-7.]

**Classification:** Secret

**Sponsor:** OD(PA&E)  
Room 2D278, The Pentagon  
Washington, DC 20301

Mr. Dan Barker (703) 697-4311

**Performer:** IDA

Mr. Timothy J. Graves (703) 845-2339

<b>Resources:</b>	Dollars	Staff-Years
FY 92	40,000	.3
FY 93	300,000	2.4

**Schedule:** Start: January 1992  
End: September 1995

**Data Base:** AMORD

Description: FYDP data for all DoD programs to include  
Defense Mission Categories, Program Elements

Automation: PC in FoxPro, C, Oracle, UNIX-based server

**Publications:** TBD

**Category:** II.A.1, II.A.2, II.B

**Keywords:** Government, Programming, Forces, Mathematical Modeling,  
Computer Model

**Title:** National Defense Program Costs

**Summary:** Develop a computer model that permits small to medium size countries to estimate the capabilities and resource requirements of alternative future force compositions. The model provides cost estimates that are sensitive to the following force characteristics: numbers and types of combat and support units, numbers and types of equipment, unit manning, peacetime training levels (optempo), equipment modernization, and WRM inventory changes. The model can be set up to use currencies, cost accounts personnel classifications, and a wide variety of force and equipment configurations. Cost modeling provides the ability to model direct and indirect personnel costs, fixed and variable operating costs, and multi-year procurement funding. Users have convenient access to all characteristics of the model so they can adjust the model's use to their own circumstances. [This task appeared in the 1994 catalog as IDA-8.]

**Classification:** Unclassified

**Sponsor:** OD(PA&E)  
Europe and Pacific Division  
Room 2C270, The Pentagon  
Washington, DC 20301  
Col. Gary Morgan                      697-6415

**Performer:** IDA  
Mr. James L. Wilson                      (703) 845-2469

<b>Resources:</b>	Dollars	Staff-Years
FY 93	25,000	.2
FY 94	225,000	1.5
FY 95	550,000	3.5

**Schedule:** Start: September 1993  
End: August 1996

**Data Base:** None

**Publications:** TBD

**Category:** II.A.2

***Keywords:*** Government, Estimating, Forces, Life Cycle, Fixed Costs, Variable Costs, Computer Model



**Title:** Planning-Defense Economic Impact Modeling System (P-DEIMS)

**Summary:** Maintain the currency of the Defense Translator within DEIMS by periodically updating the various sections of the translator associated with the appropriations accounts. The Defense Translator accounts for the distribution of defense spending among the industries producing the goods and services that DoD buys, and describes the commodity composition of defense demands. [This task appeared in the 1994 catalog as IDA-16.]

**Classification:** Unclassified

**Sponsor:** OD(PA&E)/RA/EARPD  
Room 2D300, The Pentagon  
Washington, DC 20301  
Mr. Paul Dickens (703) 697-2999

**Performer:** IDA  
Dr. Thomas P. Frazier (703) 845-2132  
Mr. Stephen K. Welman (703) 845-2212

<b>Resources:</b>	Dollars	Staff-Years
FY 85	122,000	1.0
FY 87	182,000	1.5
FY 88	40,000	0.3
FY 90	75,000	0.6
FY 92	60,000	0.5
FY 93	80,000	0.7
FY 94	160,000	1.1

**Schedule:** Start: July 1985  
End: December 1996

**Data Base:** N/A

***Publications:*** "A Comparison of the DEIMS and the Department of Commerce Translator Vectors," IDA Paper P-2647, T. P. Frazier, S. K. Welman, R. H. White, March 1993, Unclassified

"A User's Manual for the Revised Defense Translator Model," IDA Document D-796, T. P. Frazier and J. B. Tate, June 1990, Unclassified

"The Revised Defense Translator," IDA Paper P-2141, T. P. Frazier, C. G. Campbell and R. T. Cheslow, October 1989, Unclassified

***Category:*** II.A.1, II.A.2

***Keywords:*** Government, Analysis, Budgeting, Forces, Production, Manufacturing, Mathematical Modeling, Economic Analysis, Study

**Title:** Software Cost Model Evaluation

**Summary:** This task seeks to empirically evaluate two widely used software cost estimating models using data on about 66 completed software projects.

**Classification:** Unclassified

**Sponsor:** OD(PA&E)  
Room 3D322, The Pentagon  
Washington, D. C. 20301

Dr. Vance Gordon (703) 693-7827

**Performer:** IDA

Dr. Thomas Frazier (703) 845-2132

**Resources:**

	Dollars	Staff-Years
FY 94	\$25,000	.20

**Schedule:** Start: October 1994  
End: On-going

**Data Base:** N/A

**Publications:** TBD

**Category:** I.A.1, II.B.2

**Keywords:** Government, Estimating, Infrastructure, Engineering, Mathematical Modeling, Study

**Title:** Estimation of Medical-Specific Inflation Indices

**Summary:** The objective of this task is to decompose the sources of inflation in the DoD medical sector. Some of these sources may follow by analogy with the civilian economy, where it has long been observed that medical inflation exceeds general inflation. However, part of the task is to determine the validity of this analog.

**Classification:** Unclassified

**Sponsor:** Director, Program Analysis and Evaluation  
Mr. Paul Dickens III (703) 697-2999

**Performer:** IDA  
Dr. Matthew S. Goldberg (703) 845-2099

<b>Resources:</b>	Dollars	Staff-Years
FY 95	\$250,000	1.5

**Schedule:** Start: March 1995  
End: January 1996

**Data Base:** Description:  
Automation: None

**Publications:** Final report at end of project

**Category:** II.C

**Keywords:** Government, Analysis, Programming, Infrastructure, Operations and Support, Fixed Costs, Variable Costs, Data Collection, Economic Analysis, Statistics/Regression, Data Base, Study

**ARMY COST AND ECONOMIC ANALYSIS CENTER**

<b>Name</b>	U.S. Army Cost and Economic Analysis Center (USACEAC)
<b>Address</b>	5611 Columbia Pike Falls Church, VA 22041-5050
<b>Director</b>	Robert W. Young Cost Research Chief: Richard D. Bishop (703) 681-9124 DSN 761-9124 FAX (703) 681-8732
<b>Size</b>	Professional: 1
<b>Focus</b>	<p>The focus of the Army's Centrally Funded Cost Research Program is to improve the capability of the Army to develop Cost Estimates and Economic Analyses.</p> <p>The main categories of concentration are:</p> <ol style="list-style-type: none"> <li>1. Data Base Development</li> <li>2. Methodology Development</li> <li>3. Costing the Effects of New Technology</li> <li>4. Software Support Systems</li> <li>5. PPBES Linkages</li> </ol> <p>The Commodity areas we cover are:</p> <ol style="list-style-type: none"> <li>1. Aircraft Systems</li> <li>2. Missiles and Space Systems</li> <li>3. Wheel and Tracked Combat Vehicle Systems</li> <li>4. Communications and Electronics Systems</li> <li>5. General Systems/Future Technology/Tools and Models</li> <li>6. Information Management Systems</li> <li>7. Force Unit Costing</li> <li>8. Operating and Support Costing</li> </ol>
<b>Activity</b>	<p>Number of projects in progress: 12-15</p> <p>Average duration of a project: 6-12 months</p> <p>Average number of staff members assigned to a project: 0.25</p> <p>Average number of staff-years per project: 2.8</p> <p>Percent of effort conducted by subcontractors 92.0%</p>

**Title:** Aircraft Data Base and Methodology Enhancement

**Summary:** Updated the Aircraft Module of the USACEAC Standard Data Base with the latest CDSR information. Converted the Aircraft Module from INFOARCH to PC-ACDB and studied methods to cost composite materials, advanced avionics, and modification of existing aircraft. [This task appeared in the 1994 catalog as CEAC-1.]

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Center  
Andy Pozda (703) 756-0326  
DSN 289-0326

**Performer:** Science Applications International Corporation (SAIC)  
Paul Popovich

**Resources:** Dollars: \$150,000  
Staff-years:

**Schedule:** Start: April 1994  
End: February 1995

**Data Base:** INFOARCH & PC-ACDB, CDSR data for Army Helicopters  
Automation: IBM PC-compatible 386 or later

**Publications:**

**Category:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Aircraft, Electronics/Avionics, Material, Modification, CPR/CCDR, Data Collection, Data Base, CER

**Title:** Wheel and Track Vehicle Module of USACEAC Standard Data Base Architecture

**Summary:** Improved the WTCV data base by collecting, analyzing, mapping, normalizing and loading the current Wheel and Tracked Combat Vehicle Contract Data into PC-ACDB. [This task appeared in the 1994 catalog as CEAC-2.]

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Center  
Terry Mateer (703) 756-0349  
DSN 289-0349

**Performer:** Science Applications International Corporation (SAIC),  
Management Analysis, Inc.(MAI)

Robert Currie  
Lynette Wagner (MAI)

**Resources:** Dollars: \$150,000  
Staff-years:

**Schedule:** Start: April 1994  
End: February 1995

**Data Base:** INFOARCH & PC-ACDB, CCDR and Contract Data  
Automation: IBM PC-compatible 386 and later

**Publications:**

**Category:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Land Vehicles, EMD,  
Production, CPR/CCDR, Data Collection, Data Base, CER



**Title:** Missile Module of USACEAC Standard Data Base Architecture

**Summary:** Collected, analyzed, mapped, normalized and loaded the Army Missile data plus additional Navy and Air Force missile data (cost and technical) into PC-ACDB (Missile Module) and created a Missile CER library. [This task appeared in the 1994 catalog as CEAC-3.]

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Center  
Mort Anvari (703) 756-0326  
DSN 289-0326

**Performer:** Tecolote Research, Inc.  
Bill Rote  
Ramie Cox

**Resources:** Dollars: \$157,000  
Staff-years:

**Schedule:** Start: April 1994  
End: February 1995

**Data Base:** INFOARCH & PC-ACDB, Missile CCDD data base  
Automation: IBM PC-compatible, 386 and later

**Publications:** "Documentation and User's Guide—Missile Module of USACEAC Standard Architecture Implementation for Missile Cost Estimation," Tecolote Research, Inc., December 1993

**Category:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Missile, EMD, Production, CPR/CCDD, Data Collection, Data Base, CER

**Title:** Communications/Electronics Module of USACEAC Standard Data Base Architecture

**Summary:** Collected, analyzed, mapped, normalized and loaded the raw data for Army Tactical Communications and Electronics systems (cost and technical) into PC-ACDB and performed several Comm-Elec special studies. [This task appeared in the 1994 catalog as CEAC-4.]

**Classification:** Unclassified, Proprietary

**Sponsor:** U.S. Army Cost and Economic Analysis Center  
B. Williams (703) 756-0346  
DSN 289-0346

**Performer:** SYTEX/EER  
Jim Soos

**Resources:** Dollars: \$150,000  
Staff-years:

**Schedule:** Start: April 1994  
End: February 1995

**Data Base:** INFOARCH & PC-ACDB, CCDR/CPR/Contract Data  
Automation: IBM PC-compatible

**Publications:**

**Category:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Communications, Electronics/Avionics, EMD, Production, CPR/CCDR, Data Collection, Data Base, CER

**Title:** The Army Force Cost System (FORCES)

**Summary:** Updated the costs and factors in FORCES and provide full documentation. Converted all software programs in the Force Cost Model to Foxpro. The Army Force Cost System includes the Exportable Force Cost Data Base, Force Cost Model and the Cost Factor Handbook. All parts of FORCES can be used on normal 386 PCs. [This task appeared in the 1994 catalog as CEAC-5.]

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Center  
Robert Suchan (703) 756-0336  
DSN 289-0336

**Performer:** Management Analysis, Inc. (MAI)  
Wayne Grant

**Resources:** Dollars: \$350,000  
Staff-years:

**Schedule:** Start: March 1994  
End: August 1994

**Data Base:** The Exportable Force Cost Data Base and the Cost Factor Handbook  
Automation: The Exportable Force Cost Data Base (EFCDB Version 95.0) ) runs on IBM PC Compatibles and uses Foxpro and DbaseIII

**Publications:**

**Category:** II.A.1

**Keywords:** Government, Estimating, Analysis, Forces, Computer Model

**Title:** Operating and Support Management Information System (OSMIS)

**Summary:** OSMIS is a Management Information System designed to assist the Army in determining the historical operating and support costs of selected major fielded weapon systems through the production of cost data and cost factors based on actual usage data. The cost data generated from OSMIS is derived from interaction with existing Army Logistics Support Management Information Systems. [This task appeared in the 1994 catalog as CEAC-6.]

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Center

Terry Mateer (703) 756-0336  
DSN 289-0336

**Performer:** CALIBRE Systems, Inc.

Les Zavec; Contract Project Manager

**Resources:** Dollars: \$2,000,000

Staff-years:

**Schedule:** Start: Annual Contract

End:

**Data Base:**

**Publications:** FY 95 U.S. Army Cost Per Flying Hour Reimbursement Rate Methodology and Definitions," August 1994

Army Aircraft Reimbursement," August 1994

"U.S. Army Operating and Support Management Information System (OSMIS)/Visibility and Maintenance of Operating and Support Cost (VAMOSC) Annual Report (FY93)," May 1994

"Supply Class II/IV Costs," November 1994

**Category:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Budgeting, Weapons Systems, Operations and Support, Data Collection, Data Base

**Title:** Millimeter Wave and Other Advanced Seekers

**Summary:** Developed cost estimating relationships (CERs) for estimating the costs of guidance concepts. Developed a method for estimating the hardware manufacturing costs of the hardware components in a RF/millimeter wave seeker. [This task appeared in the 1994 catalog as CEAC-7.]

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Center  
Richard D. Bishop (703) 756-2124  
DSN 289-2124

**Performer:** Technomics, Inc.  
John Horak

**Resources:** Dollars: \$108,000  
Staff-years:

**Schedule:** Start: March 1994  
End: September 1994

**Data Base:**

**Publications:**

**Category:** I.B.1

**Keywords:** Government, Estimating, Analysis, CPR/CCDR, Data Collection, CER

**Title:** Update Army Manpower Cost System (AMCOS) Data Base, Model

**Summary:** Updated the AMCOS data base and model including policy changes and current cost and personnel factors. Also developed a more convenient link to ACEIT. [This task appeared in the 1994 catalog as CEAC-8.]

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Center  
Judy Matthews (703) 756-0335  
DSN 289-0335

**Performer:** ARS

**Resources:** Dollars: \$112,000  
Staff-years:

**Schedule:** Start: April 1994  
End: October 1994

**Data Base:** Automation: IBM PC-compatible

**Publications:**

**Category:** II.A.1

**Keywords:** Government, Estimating, Analysis, Manpower/Personnel, Operations and Support, Labor, Data Collection, Computer Model

**Title:** ACEIT/PC-ACDB Training and Support for Army Cost Estimating Requirements

**Summary:** This project funds the Army portion of a joint effort of the US Army Cost & Economic Analysis Center & the Air Force Electronic Systems Center and Air Force Cost Analysis Agency to meet the Army Cost Estimation Support Requirements. This funds approximately 14 ACEIT Training Sessions across the Army and provides dial up support for technical assistance when required. This includes the update of annual Inflation Indices, problem resolution, bug fixes and configuration control for Army Acquisition Information/Data Bases. This contract acts as the Super Data Base Administrator (DBA) for USACEAC commodity contractors DBAs. [This task appeared in the 1994 catalog as CEAC-9.]

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Center  
Richard Bishop (703) 756-2124  
DSN 289-2124

**Performer:** Tecolote Research, Inc.  
Tom Kielpinski, et al.

**Resources:** Dollars: \$275,000  
Staff-years:

**Schedule:** Start: May 1994  
End: February 1995

**Data Base:** Automation: IBM PC-compatible

**Publications:** ACE-IT Users Guides

**Category:** II.A.1, II.A.2

**Keywords:** Government, Weapon Systems, Life Cycle, Labor, Material, Engineering, Manufacturing, CPR/CCDR, WBS, Training, Data Base

**Title:** OMA Factors Study

**Summary:** Developed methodology to breakout BASOPS and RPMA lettered accounts, as well as other Installation level operations to support policy decisions at HQDA level. This also supports separate OPTEMPO and indirect OPTEMPO related costs. Resulting taxonomies, methodologies and cause and effect relationships developed will be used to update future cost factors in the Army Force Cost System (FORCES) and provide the basis for Activity Based Costing (ABC) initiatives focussed on the installation. [This task appeared in the 1994 catalog as CEAC-10.]

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Center  
Robert Suchan (703) 756-0335  
DSN 289-0335

**Performer:** Management Analysis, Inc. (MAI)  
Wayne Grant

**Resources:** Dollars: \$343,000  
Staff-years:

**Schedule:** Start: September 1993  
End: September 1994

**Data Base:** The Exportable Force Cost Data Base  
Automation: The Exportable Force Cost Data Base (EFCDB  
Version 95.0) runs on IBM PC Compatibles and  
uses Foxpro and DbaseIII

**Publications:**

**Category:** II.D

**Keywords:** Government, Estimating, Analysis, Forces, Operations and  
Support, Data Collection, Study, Method



**Title:** The Development of Cost Factors for Data, Initial Consumables and Initial Reparables

**Summary:** Created a database from which cost factors can be developed.  
Developed methodology to generate these cost factors.

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Command (CECOM)  
Paul M. Novick (703) 544-4552  
DSN 995-4552

**Performer:** Paul M. Novick

**Resources:** Dollars: \$  
Staff-years:

**Schedule:** Start: October 1994  
End: January 1995

**Data Base:** CPR and CSSR Reports, POEs, CECOM employee interviews  
Automation: N/A

**Publications:** "Cost Factors for Data, Initial Consumables and Initial Reparables", Paul M. Novick

**Category:** II.A.1

**Keywords:** Government, Estimating, Weapon Systems, Production, Spares/Logistics, Data Collection, Data Base, Method

**Title:** Cost Factors for Communications and Electronics Programs

**Summary:** Developed factors for estimating contractor costs for System Engineering/System Project Management, Training and System Test and Evaluation.

**Classification:**

**Sponsor:** U.S. Army Cost and Economic Analysis Command (CECOM)  
Henry Weltzien (703) 544-3197  
DSN 995-3197

**Performer:** CECOM  
Henry Weltzien

**Resources:** Dollars: \$  
Staff-years:

**Schedule:** Start: August 1994  
End: February 1995

**Data Base:** Factors were developed using a data base of completed RDT&E contracts which had requirements for cost performance reporting  
Automation: N/A

**Publications:** N/A

**Category:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Electronics/Avionics, EMD, WBS, Data Collection, Data Base, Method

**Title:** AGS EMD Cost Categorization Crosswalk

**Summary:** Analysis of cost overruns on AGS EMD contract to determine the nature and causes of cost growth. Data extracted from CPR's.

**Classification:**

**Sponsor:** AGS-PMO

Bill White

DSN 786-7699

**Performer:** AMSTA-RM-VC

Kathy Dymecki

Dawn Garmenn

**Resources:** Dollars: \$

Staff-years:

**Schedule:** Start:

End: At completion of AGS EMD Phase

**Data Base:** Spreadsheet

Automation: Lotus 3.1 on PC

**Publications:**

**Category:**

**Keywords:** Government, Analysis, Land Vehicles, EMD, CPR/CCDR, Data Collection, Case Study, Study

**Title:** AGS EMD Contract Cost Overrun Analysis

**Summary:** Analysis of cost overruns on AGS EMD contract to determine the nature and causes of cost growth. Data extracted from CPR's.

**Classification:**

**Sponsor:** AGS-PMO

Bill White

DSN 786-7699

**Performer:** AMSTRA-RM-VC

Kathy Dymecki

Larry Delaney

**Resources:** Dollars: \$

Staff-years:

**Schedule:** Start:

End: At completion of AGS EMD Contract

**Data Base:** Spreadsheet

Automation: Lotus 3.1 on PC

**Publications:**

**Category:**

**Keywords:** Government, Analysis, Land Vehicles, EMD, CPR/CCDR, Data Collection, Case Study, Study

**NAVAL CENTER FOR COST ANALYSIS**

<b>Name</b>	Naval Center for Cost Analysis	
<b>Address</b>	Suite 400, West Tower 1111 Jefferson Davis Highway Arlington, VA. 22202-4306	
<b>Director</b>	Mr. John Smuck (Acting) (703) 604-0308 Deputy Director: Mr. Richard Collins (Acting) (703) 604-0305	
<b>Size</b>	Total: 36 civilian; 14 military Professional: 32 civilian; 14 military	
<b>Focus</b>	<p>Naval Center for Cost Analysis (NCA) is responsible for preparing the DoN component cost analysis, administering the DoN contractor cost data reporting program, managing the DoN VAMOSC Program, coordinating the DoN cost research program, and performing financial/economic analysis of DoN contractors.</p> <p>The focus of the NCA cost research program is the following:</p> <ol style="list-style-type: none"> <li>1. Continued improvement in the accuracy and scope of cost data bases, e.g., VAMOSC, CCDR.</li> <li>2. Improved methods for evaluating of technical and cost risk and uncertainty.</li> <li>3. Improved methods for evaluating the dynamics of operational and management resource on system LCC.</li> <li>4. Continued enhancements to methods for estimating EMD costs.</li> <li>5. Improved understanding of environmental regulations and their impact on LCC.</li> <li>6. Refinements in CERs and cost models in support of system/subsystems cost tradeoffs and evaluations of marginal costs.</li> </ol>	
<b>Activity</b>	Number of projects in progress:	18
	Average duration of a project:	6-9 months
	Average number of staff members assigned to a project:	1-2
	Average number of staff-years expended per project:	.22
	Percent of effort conducted by staff:	88%
	Percent of effort conducted by consultants	12%
	Percent of effort conducted by subcontractors	0%

**Title:** Ship Upgrade Cost Model

**Summary:** Develop model that estimates the construction costs associated with major upgrades (i.e., forward-fit) of Naval vessels, including surface combatants, auxiliary and amphibious ships. This effort includes the update/expansion of the existing cost/technical database and development of parametric cost estimating relationships (CERs) via statistical analysis. [This task appeared in the 1994 catalog as NCA-9.]

**Classification:** Cost Data—Business Sensitive Technical Characteristics—  
Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

**Performer:** Gibbs & Cox, Inc.  
1235 Jefferson Davis Highway  
Arlington, VA 22202

Mr. Eric Midboe (703) 416-3620

**Resources:** Dollars: \$64K  
Staff-years:

**Schedule:** Start: July 1993  
End: June 1995

**Data Base:** Ship upgrade cost and technical characteristics

**Publications:** TBD

**Category:** I.A.1, II.C

**Keywords:** Government, Estimating, Ships, Production, WBS, Data  
Collection, CER, Database, Method

**Title:** Ship System Modernization Database

**Summary:** Update NCA's ship modernization cost database which includes shipboard installation labor/ material cost and electronics/ordnance procurement cost.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

Rick Collins (703) 604-0280

**Performer:** Contractor TBD

**Researchers:** TBD

**Resources:** Dollars: \$75K  
Staff-years:

**Schedule:** Start:  
End: FY99

**Data Base:** Ship system modernization cost characteristics

**Publications:** TBD

**Category:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Ships, Production, WBS, Data Collection, Database



**Title:** Surface Ships Construction Cost Model Update

**Summary:** Update NCA's existing model that estimates the construction cost of lead surface (combatant, auxiliary and amphibious) ships. This effort includes the update/expansion of the existing cost/technical database and development of parametric cost estimating relationships (CERs) via statistical analysis. [This task appeared in the 1994 catalog as NCA-11.]

**Classification:** Cost Data—Business Sensitive Technical Characteristics—Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

Rick Collins (703) 604-0280

**Performer:** Contractor TBD

**Resources:** Dollars: \$140K  
Staff-years:

**Schedule:** Start: FY98  
End: FY00

**Publications:** TBD

**Data Base:** Surface ship construction cost and technical characteristics

**Category:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Ships, Production, WBS, Data Collection, CER, Database, Method

**Title:** Research Investigations of COTS, Ruggedized and MILSPEC Hardware

**Summary:** Review recent development in the U.S. electronics industry and current DOD procurement policies enacted in response to these development and current military requirements. Compare test and inspection requirements for MILSPEC and non MILSPEC components. Develop a limited cost/technical database that compares the prices of comparable MILSPEC, ruggedized and COTS components.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

Ms. Cheri Cummings (703) 604-0275

**Performer:** Cygnus Associates, Inc  
PO Box 2642  
Springfield, VA 22152-0642

Mr. Bob Swan (703) 425-5466

**Resources:** Dollars: \$50K  
Staff-years:

**Schedule:** Start: April 1995  
End: February 1995

**Data Base:** Component Cost Data and Technical Characterisitics

**Publications:** Research Investigations of COTS, Ruggedized and MILSPEC Hardware

**Category:** I.B.1, IIB, IIC

**Keywords:** Government, Estimating, Electronics/Avionics, Production, Data Collection, Database, Study

**Title:** Affordability Through Commonality Cost Factors

**Summary:** Develop an approach to assessing the cost impact of applying the concept of affordability through commonality to ship construction. The approach should be WBS specific and include factors that can be used to adjust ship detail design and construction cost estimates generated by NCA's existing cost models.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Aanalysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

Mr. Rick Collins (703) 604-0280

**Performer:** NCA In-House

**Resources:** Dollars  
Staff-years: 1 Manyear

**Schedule:** Start: July 1995  
End: June 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B.1, II.A.2

**Keywords:** Government, Estimating, Ships, EMD, Production, Integration, Survey, Method

**Title:** Ship System Integration Cost Database/Model

**Summary:** Develop a database and cost estimating methodology for projecting hardware integration and hardware/software integration cost for shipboard electronic and weapon systems. The database should include cost data, technical characteristics and other relevant information (e.g., software size) for a variety of systems, including sonar, radar, fire control, EW and launching systems. The cost data should include relevant contractor and Navy in-house costs.

**Classification:** Cost Data: Business Sensitive Technical Characteristics:  
Classified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway,  
Suite 400 West Tower  
Arlington, VA 22202-4306

Mr. Rick Collins (703) 604-0280

**Performer:** NCA In-house

**Researcher:** TBD

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** Ship systems electronics cost and technical characteristics

**Publications:** TBD

**Category:** II.A.2

**Keywords:** Government, Estimating, Weapon Systems, Missiles, Ships, Electronics/Avionics, EMD, Production, Integration, Data, Collection, Database, Method

**Title:** Electronics System Technical Database

**Summary:** Develop a database for use (in conjunction with a procurement cost database) in generating parametric cost estimating relationships (CERs) and analogy-based cost estimates for shipboard and airborne electronic systems. The database should include physical and performance characteristics for a variety of systems, including sonar, radar, fire control, EW and launching systems. The cost data should include relevant contractor and Navy in-house costs.

**Classification:** Classified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

Mr. Rick Collins (703) 604-0280

**Performer:** NCA In-house

**Researcher:** TBD

**Resources:** Dollars:  
Staff-years: .5 Manyear

**Schedule:** Start: October 1995  
End: March 1996

**Data Base:** Electronic systems physical and performance characteristics

**Publications:** TBD

**Category:** II.A.2

**Keywords:** Government, Estimating, Electronics/Avionics, EMD, Production, Size, Data Collection, Database, Method

**Title:** Electronics Systems Procurement Hardware Cost Estimating Methodology

**Summary:** Develop parametric procurement cost estimating relationships (CERs) for shipboard and airborne electronics hardware. CERs will be investigated for a variety of systems, including sonar, radar, fire control, EW and launching systems.

**Classification:** Classified

**Sponsor:** Naval Center for Cost Analysis  
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Suite 400, West Tower  
Arlington, VA 22202-4306

Mr. Rick Collins (703) 604-0280

**Performer:** NCA In-house

**Researcher:** TBD

**Resources:** Dollars:  
Staff-years: .5 Manyear

**Schedule:** Start: April 1996  
End: September 1996

**Data Base** None

**Publications:** TBD

**Category:** II.A.2

**Keywords:** Government, Estimating, Electronics/Avionics, Production, Labor, Material, Overhead, Statistics/Regression, CER

**Title:** Ship Conversion Cost Database/Model

**Summary:** Develop a ship conversion database and cost estimating methodology. The database should include both cost data and technical characteristics of military (U.S. and foreign) and commercial ship conversions. The cost data should encompass detail design and construction.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

Mr. Rick Collins (703) 604-0280

**Performer:** NCA In-house

**Researchers:** TBD

**Resources:** Dollars:  
Staff-years: .5 Manyear

**Schedule:** Start: FY97  
End: FY97

**Data Base:** Ship conversion cost and technical characteristics

**Publications:** TBD

**Category:** II.C

**Keywords:** Government, Estimating, Ships, EMD, Production, WBS, Data Collection, Database, Method

**Title:** Ship System Modernization Cost Database

**Summary:** Update the electronics/ordnance portion of NCA's ship modernization cost database. Data collected includes shipyard installation labor and material cost and equipment procurement cost.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

Mr. Rick Collins (703) 604-0280

**Performer:** Gibbs & Cox, Inc.  
1235 Jefferson Davis Highway, Suite 700  
Arlington, VA 22202

Mr. Eric Midboe (703) 416-3620

**Resources:** Dollars: \$64K  
Staff-years:

**Schedule:** Start: July 1993  
End: June 1995

**Data Base:** Ship system modernization cost

**Publications:** TBD

**Category:** I.A.1

**Keywords:** Government, Estimating, Ships, Production, WBS, Data Collection, Database



**Title:** Ship Upgrade Cost Model Update

**Summary:** Update NCA's existing model that estimates the construction costs associated with major upgrades (i.e., forward-fit) of Naval vessels, including surface combatants, auxiliary and amphibious ships. This effort includes the update/expansion of the existing cost/technical database and development of parametric cost estimating relationships (CERs) via statistical analysis.

**Classification:** Cost Data—Business Sensitive  
Technical Characteristics—Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

Mr. Rick Collins (703)-604-0280

**Performer:** Contractor TBD

**Resources:** Dollars: \$75K  
Staff-years:

**Schedule:** Start: FY00  
End: FY00

**Data Base:** Ship upgrade cost and technical characteristics

**Publications:** TBD

**Category:** I.A.1, II.C

**Keywords:** Government, Estimating, Ships, Production, WBS, Data Collection, CER, Database, Method

**Title:** Impact of COTS Hardware Usage on Contractor and Government In-House Support Cost

**Summary:** Develop an approach to estimating contractor and government in-house (GIH) (i.e., laboratory and field activity) support cost for shipboard electronics programs that utilize commercial off-the-shelf (COTS) and ruggedized COTS hardware. At a minimum, this effort will result in: 1) a matrix that relates a given MILSPEC/MILSTD to the contractor and GIH cost element(s) (i.e., program management, system engineering, T&E, data, etc.) that it influences and 2) identification and quantification of the relevant relationships (e.g., if MILSPEC A is waived, then T&E cost will decrease by 10-20 percent).

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy  
Suite 400, West Tower  
Arlington, VA 22202-4306

Mr. Rick Collins (703) 604-0280

**Performer:** NCA In-house

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** Start: June 1995  
End: December 1995

**Data Base:** TBD

**Publications:** TBD

**Category:** IA, IIA1

**Keywords:** Government, Estimating, Electronics, EMD, Production, Labor, Survey, Method

**Title:** The Application of Artificial Intelligence to Cost Estimating

**Summary:** Phase I: Explore the feasibility of applying fuzzy logic and artificial intelligence (AI) to the field of cost estimating. Fuzzy logic places less reliance on the concept of probability, addresses the absolute existence of technical risk and attempts to rid the inherent bias of human decision-making. Mathematical models based on fuzzy logic will be developed to test the hypothesis. Phase II: Develop a basic (small scale) cost estimating model to demonstrate the effective applicability of AI. Upon successful demonstration, collect and assimilate various technical, programmatic and cost data to generate a comprehensive program-analyzing model.

**Classification:** Unclassified

**Sponsor:** NCA  
1111 Jefferson Davis Hwy  
Suite 400, West Tower  
Arlington, VA 22202

**Performer:** NCA, In-House  
Al Leung (703) 604-0294  
Mark B. Daley (703) 604-0279

**Resources:** Dollars:  
Staff-years: 3 Manyears

**Schedule:** Start: June 1995  
End: March 1998

**Data Base:** Unknown

**Publications:** Completed study report

**Category:** I.A, II.B, II.C, II.D

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Life Cycle, Risk/Uncertainty, Mathematical Modeling, Expert System, Study

**Title:** Incorporating Technical Risk in Cost Estimates

**Summary:** This research involves identifying and quantifying the impact of technical parameters (such as weight, power output, speed, etc.) that are not well defined early in a program and pose risk to the performance and cost of the end product. The researcher will develop a historical database of various Navy systems and determine the upper and lower bounds within which a given parameter could vary. These bounds will form the basis for uncertainty analysis of future systems.

**Classification:** Unclassified

**Sponsor:** NCA  
1111 Jefferson Davis Hwy  
Suite 400, West Tower  
Arlington, VA 22202

**Performer:** NCA, In-House

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** Start: March 1996  
End: January 1997

**Publications:** Completed study report

**Data Base:** Contains historical cost data from government and Navy contractors for various Navy weapon systems programs

**Category:** I.A, II.B, II.C and II.D

**Keywords:** Government, Study, Weapon Systems, EMD, Engineering, Variable Costs, Data Collection, Data Base

**Title:** The Cost Impact of CAD/CAM on Weapon System Engineering Design, Development and Manufacturing

**Summary:** The objective of this study is to quantify the cost savings from using a CAD/CAM system in the engineering design and manufacturing process. The widespread use of the CATIA system used on multiple weapon system platforms will be investigated. While it is expected that there is a large initial fixed cost at the beginning of the design process, a net savings should be realized from the reduced time for engineering rework, manufacturing setup and optimized manufacturing processes.

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400 West Tower  
Arlington, VA 22202

**Classification:** Unclassified

**Performer:** NCA, In-House

**Resources:** Dollars:  
Staff-years: 2 Manyear

**Schedule:** Start: January 1996  
End: January 1997

**Data Base:** The data base will include information on quantified and substantiated contractor data on man-hour savings and product information on the various CAD/CAM systems with differences in performance identified.

**Publications:** Completed study report

**Category:** I.A, II.B, II.C and II.D

**Keywords:** Government, Analysis, Weapon System, EMD, Manufacturing, Labor, Schedule, Case Study, Review, Study

**Title:** Estimating Weapon System Modification Kit and Integration Cost

**Summary:** The purpose of this research is to develop a parametric model that can be used to estimate the cost of installing electronics and ordnance on aircraft and ships. A database of historic installation cost data, as well as physical, performance and program data, will be used to develop cost estimating methodology.

**Classification:** Unclassified

**Sponsor:** NCA  
1111 Jefferson Davis Hwy  
Suite 400, West Tower  
Arlington, VA 22202

**Performer:** NCA. In-House

**Resources:** 2 Staff-years

**Schedule:** Start: March 1996  
End: March 1999

**Data Base:** Includes historical costs from government and Navy contractors for various weapon systems installations.

**Publications:** Completed study report

**Category:** I.A, II.B, II.C, II.D

**Keywords:** Government, Estimating, Modification, Integration, Weapon Systems, EMD, Production, Material, Labor, Data Collection, Data Base, Study

**Title:** An Alternative to Learning Curve Theory

**Summary:** With all the defense cuts, large production quantities that yield significant learning curves are becoming obsolete. Nowadays, the emphasis is on lean manufacturing efforts (cellular manufacturing, 6 sigma manufacturing, Integrated Product Teams, design to cost, etc.). Old learning curve theory is not applicable in this area. This research will attempt to bridge the old learning curve theory with the new cost reduction efforts achieved through leaner manufacturing.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy  
Suite 400, West Tower  
Arlington, VA 22202

**Performer:** NCA, In-House

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** Start: June 1996  
End: March 1997

**Data Base:** Historical data from Navy contractors that have implemented cost reduction activities (i.e., statistical process control, 6 sigma design and manufacturing, streamlining supplier contracting, virtual manufacturing, etc.).

**Publications:** Completed study report

**Category:** I.A, II.B, II.C, II.D

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Production, WBS, Mathematical Model, Cost/Production Function, Study

**Title:** Financial Forecasting for Military Contractors and the Defense Industry

**Summary:** Develop a method for forecasting the financial state of defense contractors who team up or merged as a result of military downsizing and budget cuts. Emphasis will be on overhead, labor rate, and indirect cost changes stemming from company mergers. In addition, examine the effects of lower production rates on the company's business base and the overall industrial base impacts.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy  
Suite 400, West Tower  
Arlington, VA 22202

**Performer:** NCA, In-House

**Resources:** Dollars:  
Staff-years: 2 Manyears

**Schedule:** Start: June 1995  
End: October 1996

**Data Base:** Historical financial data of defense contractors that have merged.

**Publications:** Completed study report

**Category:** I.A, II.B, II.C, II.D

**Keywords:** Government, Analysis, Reviewing/Monitoring, Weapon Systems, EMD, Production, Acquisition Strategy, Production Rate, Economic Analysis, Review, Study



**Title:** Developing Correct Correlations Among Cost Element Estimates

**Summary:** Investigate correlation among WBS element reported contractor costs and develop mathematical relationships which model historical relationships. Incorporate research into risk analysis to more accurately assess cost estimating uncertainty.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy  
Arlington, VA 22202-4306  
  
(703) 604-0312

**Performer:** NCA, In-house: J. Cherwonik

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** TBD

**Data Base:** Various Missile CCDRs and CPRs

**Publications:** Completed study report

**Category:** II.B, II.C, II.D

**Keywords:** Government, Analysis, Weapon Systems, Missiles, EMD, Production, Risk/Uncertainty, Statistics/Regression, Mathematical Model, CPR/CCDR

**Title:** The Cost Impact of Contractor Teaming on Defense Contracts

**Summary:** Collect and analyze cost and price data specific to weapon system procurement under defense contractor joint-venture arrangements. Develop methodologies and capability to estimate cost impact of contractor teaming.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy  
Arlington, VA 22202-4306  
  
(703) 604-0312

**Performer:** NCA, In-house: J. Cherwonik

**Resources:** Dollars:  
Staff-yr: 1 Manyear

**Schedule:** TBD

**Data Base:** Contracts and CPRs from joint-venture programs

**Publications:** Completed study report

**Category:** I.A., II.B, II.C, II.D

**Keywords:** Industry, Analysis, Weapon Systems, Production, Acquisition Strategy, Case Study, Economic Analysis, Method

**Title:** Cost Element Probability Distribution Profiles

**Summary:** This study will investigate and model major cost elements' underlying probability distributions. This effort will enable the analyst to more accurately conduct cost uncertainty analysis and derive bounds about a point estimate.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy  
Arlington, VA 22202-4306  
  
(703) 604-0312

**Performer:** NCA, In-house:

**Resources** Dollars:  
Staff-years: 1 Manyear

**Schedule:** TBD

**Data Base:** CCDRs and CPRs

**Publications:** Completed study report

**Category:** II.B, II.C, II.D

**Keywords:** Government, Analysis, Weapon Systems, Production, Risk/Uncertainty, Data Collection, Mathematical Modeling, Mathematical Model

**Title:** Time Phased Maintenance Costs for Shipboard Electronics

**Summary:** Investigate annual shipboard electronics maintenance costs over time to determine if maintenance costs increase over the service life. Model the rate of increase/decrease over the life cycle. The database should include ship systems by hull, the age of the systems, and the corresponding system level VAMOSC Operations and Support (O&S) data.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy  
Arlington, VA 22202-4306  
  
(703) 604-0312

**Performer:** NCA, In-house

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** TBD

**Data Base:** Time Phased Shipboard Electronics O&S Database

**Publications:** Completed study report

**Category:** II.B, II.C, II.D

**Keywords:** Government, Analysis, Ships, Electronics/Avionics, Operations and Support, Sustainability, Statistics/Regression, Mathematical Model

**Title:** COTS vs. Ruggedized COTS vs. MILSPEC Equipment Cost Database and Estimating Methodology

**Summary:** Develop a database to facilitate MILSPEC vs. ruggedized COTS vs. COTS equipment trade-off studies and estimating methodology development. The database should include cost and technical data to support analysis at three levels of detail: 1) component (e.g., semiconductors, microcircuits, resistors); 2) circuit card assembly (CCA); and 3) cabinet. While component and CCA level data are readily available from qualified DoD vendors, cabinet-level data for COTS and ruggedized COTS cabinets are not. NCA, with ASN(RD&A) and SYSCOM assistance, will request the prime contractors for select systems in production to generate cost estimates for the COTS and ruggedized COTS equivalent of select MILSPEC cabinets. These estimates will be compared to the actuals for the delivered MILSPEC cabinets.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy.  
Suite 400, West Tower  
Arlington, VA 22202-4306

Mr. Rick Collins (703) 604-0280

**Performer:** NCA in-house

**Resources:** Dollars:  
Staff-years: 2 Manyears

**Schedule:** Start: June 1995  
End: June 1996

**Database:** MILSPEC, Ruggedized COTS and COTS Cost and Technical Data

**Publications:** TBD

**Category:** I.A, II.B, II.C, II.D

**Keywords:** Government, Industry, Estimating, Electronics/Avionics, Method, Production, Data Collection, Data Base

**Title:** Software Development Cost Estimating Database and Methodology

**Summary:** Compile a database composed of actual software development productivity and labor rate data for a variety of ArManyears, Navy and Air Force weapon system programs. Develop top level relation-ships that estimate development effort as a function of number of lines of code, language, mission, etc.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy  
Suite 400, West Tower  
Arlington, VA 22202-4306

**Performer:** Naval Center for Cost Analysis

Mr. Michael Gallo (703) 604-0316  
Ms. Pam Johnson (703) 604-0294

**Resources:** Dollars:  
Staff-years: .5 Manyear

**Schedule:** Start: January 1995  
End: August 1995

**Data Base:** Weapon system software productivity and labor rate

**Publications:** TBD

**Category:** II.A.1, II.A.2, II.C

**Keywords:** Government, Estimating, Electronics/Avionics, EMD, Data Collection, Statistics/Regression, Database, CER

**Title:** Factors Impacting Software Development Cost

**Summary:** Investigate the impact of schedule on the software development process. Develop top level schedule effort equations and relationships for estimating small, medium and large software programs using NCA's in-house software database.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy  
Suite 400, West Tower  
Arlington, VA 22202-4306

**Performer:** Naval Center for Cost Analysis  
Mr. Lowell Blagmon (703) 604-0274

**Resources:** In-house

**Schedule** Start: January 1995  
End: March 1995

**Data Base:**

**Publications:** Computer Hardware/Software Glossary

**Category:** II.A.1, II.A.2, II.C

**Keywords:** Government, Estimating, Electronics/Avionics, EMD, Data Collection, Statistics/Regression, Database, CER

**Title:** Aircraft Avionics and Missile System Installation Cost Study

**Summary:** Update and expand on a previously developed aircraft avionics and missile system retrofit installation cost model.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis

**Performer:** Naval Center for Cost Analysis  
Mr. C. Wilbourn (703) 604-0310

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** Start: October 1995  
End: October 1996

**Data Base:** Includes historical cost data obtained from government and aircraft manufacturers for selected Navy aircraft programs.

**Publications:** Completed study report

**Category:** II.A.1

**Keywords:** Government, Electronics/Avionics, Missiles, Modification, Case Study, Study



**Title:** Aircraft Test and Evaluation Cost Model

**Summary:** Develop cost model and data base for analogy cost estimating of contractor and in-house test and evaluation requirements through completion of EMD. Expand research to include procurement non-recurring and system testing. Analyze cost significance of length of program, and number, duration and type of flight tests.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr.C. Wilbourn (703)604-0310

**Performer:** Naval Center for Cost Analysis

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** Start: October 1997  
End: October 1998

**Data Base:** Includes historical cost data obtained from government and aircraft manufacturers for Navy aircraft programs.

**Publications:** Completed study report

**Category:** II.A.1

**Keywords:** Government, Analysis, Aircraft, Test and Evaluation, Schedule, Data Collection, Study

**Title:** Initial Support and Initial Spares Cost Model

**Summary:** Update 1988 ILS cost model. Identify and collect historical data on major subelements of Initial Support and Initial Spares for analogy cost estimating and to revise CCDR ILS WBS elements. Repair parts, simulators and Test Performance sets are possible Level 3 items.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr.C. Wilbourn (703) 604-0310

**Performer:** Contractor TBD

**Resources:** Dollars: \$100K  
Staff-years: 1 Manyear

**Schedule:** Start: January 1996  
End: January 1997

**Data Base:** Includes historical cost data obtained from NAVAIR and aircraft manufacturers for Navy aircraft programs.

**Publications:** Completed study report

**Category:** II.A.1

**Keywords:** Government, Analysis, Aircraft, Production, WBS, Data Collection, Study

**Title:** Airframe Advanced Structure Material Cost Model

**Summary:** Update 1988 cost model on impact of use of advanced structure materials in the manufacture of aircraft. In particular, collect and analyze recent cost data by functional categories on the F-14D, V-22, F/A-18C/D and AV-8B. Also, investigate cost experience and plans for advanced material usage on the F/A-18E/F, AX, and F-22.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. C. Wilbourn (703) 604-0310

**Performer:** Naval Center for Cost Analysis

**Resources:** Dollars:  
Staff-years: 1 Manyear -1st year data collection  
1 Manyear-2nd year development estimating methodology

**Schedule:** Start: December 1997  
End: December 1999

**Data Base:** Includes historical cost data obtained from government and aircraft manufacturers for Navy aircraft programs.

**Publications:** Completed study report

**Category:** II.A.2

**Keywords:** Government, Analysis, Aircraft, Production, Material, Data Collection, Study

**Title:** Update of Naval Fixed- and Rotary-Wing Aircraft Operating and Support (O&S) Cost Model

**Summary:** Provide a revision of the December 1990 O&S cost model by updating cost and characteristic information and by adding new aircraft to the data base. Includes collection of data, development of CERs and/or cost factors, both Direct and Indirect, as identified in recent new CAIG guidelines for O&S cost estimating.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr.C. Wilbourn (703) 604-0310

**Performer:** Contractor TBD

**Resources:** Dollars: \$100K  
Staff-years: 1 Manyear

**Schedule:** Start: October 1996  
End: October 1997

**Data Base:** Tables by Aircraft Type Model Series by O&S cost element.

**Publications:** Completed study report

**Category:** II.A.2

**Keywords:** Government, Analysis, Aircraft, Operations and Support, Readiness, Data Collection, Study

**Title:** Methodology for Estimating Costs of Major Aircraft Modifications

**Summary:** Study cost experience of recently upgraded aircraft such as F-14A, EA-6B, A-6 and AV-8B to develop cost estimating methodology for future upgrade programs. Phase I will address EMD costs associated with airframe modifications and remanufacture development and avionics/engine integration. Benefits theme: Cost estimating for acquisition in the EMD phase. Phase II will address producibility and production technology for aircraft.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr.C. Wilbourn (703) 604-0310

**Performer:** Naval Center for Cost Analysis

**Resources:** Dollars:  
Staff-years: 1 Manyear - FY99 for EMD  
1 Manyear - FY00 for Procurement

**Schedule:** Start: October 1998  
End: October 2000

**Data Base:** Includes historical aircraft modification and remanufacture cost data obtained from government and aircraft manufacturers for selected Navy aircraft programs.

**Publications:** Completed study report

**Category:** I.B

**Keywords:** Government, Analysis, Aircraft, Modification, Engineering, Production, Integration, CER, Study

**Title:** Reengineering Aircraft Engine Cost Estimating Relationships (CERs)

**Summary:** Expand upon a previous research study that investigated using technical parameters, with engineering justification, in simplified CERs for engine development and production. Investigate possible parametric equations for predicting the cost of ASTOVL engines, derivative engines and turboprop engines.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. C. Wilbourn (703) 604-0310

**Performer:** Naval Center for Cost Analysis  
Mr. Mark B. Daley (703) 604-0312  
Mrs. Karen Richey (703) 604-0279

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** Start: June 1995  
End: June 1996

**Data Base:** Historical data from military engine contractors

**Publications:** Completed study report

**Category:** I.A, II.B, II.C, II.D

**Keywords:** Government, Analysis, Aircraft, Demonstration/Validation, EMD, Production, Labor, Material, Mathematical Model, Expert System, Study

**Title:** The Stealth Factor

**Summary:** The objective to this study is to investigate the cost, schedule and performance impacts of incorporating stealth technology in a weapon system's design. This study will primarily focus on the cost impacts in Weapon System design and manufacturing.

**Classification** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. C. Wilbourn (703) 604-0312  
Mr. Mark B. Daley (703) 604-0279

**Performer:** Naval Center for Cost Analysis

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** Start: June 1995  
End: June 1996

**Data Base:** Unknown

**Publications:** Completed study report

**Category:** I.A, II.B, II.C and II.D

**Keywords:** Government, Analysis, Weapon Systems,  
Demonstration/Validation, EMD, Production, Labor, Material,  
Schedule, Mathematical Model, Study

**Title:** Naval Aircraft Development to Production Transition Cost

**Summary:** This research examined the time phasing of RDT&E cost, how it is divided between the prime contractor and other (in-house) requirements and developed several CERs for estimating the full RDT&E cost given some known cost at an early point in E&MD.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
 Mr.C. Wilbourn (703) 604-0310  
 Mr. R. Swan (703) 425-5466

**Performer:** Cygnus Associates, Inc

**Resources:** Dollars: \$60K  
 Staff-years: 1 Manyear

**Schedule:** Start: April 1994  
 End: September 1994

**Data Base:** Development and production cost data collected for AV-8B, F/A-18, CH-53, SH-60, T-45 and F-14. Data was obtained from CCDR, CPR, DAES and SARs.

**Publications** Report and data disk 1995

**Category:** II.A.2

**Keywords:** Government, Estimating, Aircraft, EMD, Production, CPR/CCDR, Schedule, Data Collection, CER



**Title:** Aircraft System Integration Cost Data Base/Model

**Summary:** The purpose of this research is to develop a data base and parametric model that can be used to estimate the cost of integrating electronics and ordnance on aircraft and ships. A database of historic installation cost data, as well as, physical, performance and program data, will be used to develop cost estimating methodology.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Hwy  
Suite 400, West Tower  
Arlington, VA 22202

**Performer:** NCA, In-House

**Resources:** Dollars:  
Staff-years: 2 Manyears

**Schedule:** Start: March 1996  
End: March 1999

**Data Base:** Includes historical costs from government and Navy contractors for various weapon systems installations.

**Publications:** Completed study report

**Category:** I.A, II.B, II.C and II.D

**Keywords:** Government, Estimating, Modification, Integration, Weapon Systems, EMD, Production, Material, Labor, Data Collection, Data Base, Study

**Title:** Develop a Technical Data Base to Support O&S Costing

**Summary:** The NCA O&S Model for missiles includes actual for depot repair cost and failure rates for major assemblies. In estimating new systems, additional technical information is required to account for qualitative differences between prospective weapons and missiles in the data base. This information is part count in categories which stratify storage failure rates (static reliability.) For example, the categories could be R circuitry, analog circuitry (including electromechanical components in the IMU), digital circuitry, and non-moving mechanical parts. (Correcting for these qualitative differences may also yield normalized historical data with smaller between system variance.) Before beginning data collection, coordination will insure data will be collected on systems monitored by VAMOSC and determine how to categorize part count.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis

Dr. Nussbaum

(703) 746-2327

**Performer:** Contractor TBD

**Resources:** Dollars: \$91K

Staff-years: 910 Manhours

**Schedule:** Start: FY95 (Four months)

End: FY95

**Data Base:** Adjunct to VAMOSC

**Publications:** Completed study report

**Category:** II.C

**Keywords:** Government, Estimating, Missiles, Operations and Support, Data Collection, Data Base

**Title:** Establish an Unmanned Aerial Vehicle (UAV) Data Base

**Summary:** Naval Center for Cost Analysis will be increasingly involved doing Independent Cost Estimates (ICEs) on UAVs. The purpose of this research project is to establish a data base which includes the technical characteristics and costs of UAVs currently in production and in development. The data base will include information on both air vehicle and ground station components.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293

**Performer:** Contractor TBD

**Resources:** Dollars: \$68K  
Staff-years: 675 Manhours

**Schedule:** Start: FY96 (Three months)  
End: FY96

**Data Base:** Update UAV data base

**Publications:** Completed study report

**Category:** II.C

**Keywords:** Government, Estimating, Aircraft, EMD, Production, Data Collection, Data Base

**Title:** Missile Guidance Component Cost Data

**Summary:** Production cost information currently available to NCA does not include data on new components which are beginning to appear in tactical missile designs. Specific examples are single-board multi-channel GPS receivers, Ring Laser Gyros, 386/486 vintage mission computers, and Imaging Infra Red Seekers which use Focal Plane Array technology. The purpose of this task is to collect recurring cost data for these items along with key technical characteristics (cost drivers). The order of preference is production actual, prototype actual, and proposal data.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293

**Performer:** Contractor TBD

**Resources** Dollars: \$46K  
Staff-yr: 455 Manhours

**Schedule:** Start: FY94 (Two months)  
End: FY95

**Data Base:** Missile component data base

**Publications:** Completed study report

**Category:** II.A.1

**Keywords:** Government, Estimating, Missiles, Production, Data Collection, Data Base

**Title:** Cost Analysis Requirements Document (CARD) Template

**Summary:** The documentation requirements for ACAT I milestone reviews now includes a CARD. However, there are no standards as to the type of information which a CARD should contain. This task is to review detail level CERs for recurring manufacturing of missile components, for WBS elements in development, for below the line costs, and for the O&S phase and to prepare a draft CARD (or a specification for preparing CARDS) which elicits the information needed to prepare a Life Cycle Cost.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
CAPT D. Hefkin (703) 604-0299

**Performer:** Naval Center for Cost Analysis

**Resources:** Dollars: \$46K  
Staff-years: 455 Manhours

**Schedule:** Start: FY95  
End: FY96

**Data Base:** None

**Publications** Completed study report

**Category:** II.A.2

**Keywords:** Government, Estimating, Missiles, EMD, Operations and Support, Life Cycle, WBS, Study

**Title:** Missile Technical Characteristics and Cost Information

**Summary:** The NCA data base on missile characteristics consists of several 1976 inputs to the DOD Cost Analysis Data Base, a copy of some information published in "Aviation Week and Space Technology" (March 1979), and some handwritten summaries of indeterminant origin. Production cost information is contained in a number of published reports (readily available to NCA-4 analysts) and learning curve regressions may be available in ICEs (availability probably known only to the authors.) The purpose of this task is to consolidate existing technical information and include information on weapons produced in the 1980s, and to consolidate and update production cost information.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293

**Performer:** Contractor TBD

**Resources:** Dollars: \$545K  
Staff-yr: 5425 Manours

**Schedule:** Start: FY97  
End: FY99 (Two years)

**Data Base:** Missile technical and cost data base

**Publications** Completed study report

**Category:** II.C

**Keywords:** Government, Estimating, Missiles, Production, Data Collection, Data Base

**Title:** Certain Support Costs

**Summary:** This task has two components. The first is to achieve a better understanding of how contractors staff their production Systems Engineering/Program Management activity and how that staffing level varies with competition and extremely low rate production. The second component is to obtain actuals on government in house costs during development and production.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293

**Performer:** Contractor TBD

**Resources:** Dollars: \$205K  
Staff-years: 2030 Manhours

**Schedule:** Start: FY99 (Nine months)  
End: FY99

**Data Base:** Missile production data base

**Publications** Completed study report

**Category:** I.D

**Keywords:** Government, Estimating, Missiles, Production, Data Collection, Data Base

**Title:** Production Cost Benchmark

**Summary:** The purpose of this task is to identify time dependent trends in cost per pound of missile assemblies stratified by function, i.e. #/lb @ T1 vs first year of production for heat seeking air intercept missiles.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293

**Performer:** Contractor TBD

**Resources:** Dollars: \$68K  
Staff-years: 675 Manhours

**Schedule:** Start: FY00(Three months)  
End: FY00

**Data Base:** Missile production costs

**Publications:** Completed study report

**Category:** II.A.2

**Keywords:** Estimating, Missiles, Production, Data Collection, Data Base, Cost Progress Curve



**Title:** Platform Integration

**Summary:** The purpose of this task is to collect the actual costs of integrating tactical missiles on various platforms. Effort will consists of coordinating with type/class desks, perhaps coordinating with plant representatives/SUPSHIPS, identifying cost drivers for the particular weapon/platform combination, and mapping costs to those drivers.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293

**Performer:** Naval Center for Cost Analysis

**Resources:** Dollars \$135K  
Staff-years: 1350 Manhours

**Schedule:** Start: FY00(Six months)  
End:

**Data Base:** Missile development costs

**Publications:s** Completed study report

**Category:** II.C

**Keywords:** Industry, Government, Estimating, Missiles, EMD, Integration, Data Collection, Data Base

**Title:** Government In-House Cost Study for Air-Launched Missiles

**Summary:** This report presents a database of production phase government and contractor costs for the Sparrow, Sidewinder, Harm, and Phoenix programs. Data is tabulated for FY80-FY89 and includes information on FMS cases. No system in the data base has less than five consecutive years of information.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293  
Mr. Stranges 604-3688 x2563 NAVAIR

**Performer:** MCR Services Group, Inc. Small, Mckeel, Vielbig, and Sferra  
(703)820-4600

**Resources:** Dollars: \$60K  
Staff-years: 800 Manhours

**Schedule:** Start: July 94  
End: March 95

**Data Base:** Excel Spreadsheet

**Publications:** MCR Report TR-9507/01

**Category:** II.B

**Keywords:** Government, Estimating, Missiles, Analysis, Production, Data Collection, Time Series, Data Base, Study

**Title:** Matching Obligations to Expenditures: Equality Restricted Least Squares as the Method of First Resort

**Summary:** Cost estimating relationships for the development phase typically predict a total value which must then be spread over time. Lee, Houge, and Gallagher (OSD PA&E) analyzed constant dollar expenditures from twenty Development Phase defense contracts, and: (1) Suggest using the Rayleigh distribution to model cumulative expenditures, and (2) indicate that an iterative calculation is required to find the obligations which produce the expenditure stream. The problem of finding a feasible obligation profile can, in some cases, be solved through regression analysis. This paper formulates the regression problem, suggests that on a conceptual basis Restricted Least Squares (RLS) may be preferable to Ordinary Least Squares (OLS). It also demonstrates that a simple set of transformations converts a single equality RLS regression to an OLS problem.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293

**Performer:** Naval Center for Cost Analysis  
Mr. Reisenleiter (703) 604-0287

**Resources:** Dollars:  
Staff-years: 1 Manweek

**Schedule:** Start: September 1994  
End: September 1994

**Data Base:** None

**Publications:** NCA Technical Report 004-94, September 94

**Category:** II.D

**Keywords:** Industry, Analysis, EMD, Statistics/Regression, Mathematical Model, Study

**Title:** MK 41 Vertical Launch System Cost Analysis

**Summary:** This study reports cost research for the Sea Based Theater Ballistic (TBMD) System. It provides a technical description of VLS, development costs and the track of production contract prices.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293

**Performer:** NSWC, Dahlgren and Technomics, Inc.  
Messers. Grey, Meyerhoff, and Richardson

**Resources:** Dollars: \$50K  
Staff-years: 9 Man-months

**Schedule:** Start: FY95  
End: FY95

**Data Base:** Included in report

**Publications:** NWCC, Dahlgren Report # TBD

**Category:** II.D

**Keywords:** Industry, Analysis, Weapon Systems, EMD, Production, Data Collection, Data Base, Cost Progress Curve, Study

**Title:** Analysis of the Relationship Between Development and Production Costs and Comparisons with Other Related Step-up/Step-down Studies

**Summary:** This paper examines the relationship between development and production hardware costs. This relationship, generally referred to as a step-up or step-down factor, is used as a technique for estimating either Engineering & Manufacturing (EMD) hardware costs or Production hardware costs. Although prepared for the Missile Division, the report presents results for other commodities (RADAR, Shipboard Electronics, and Tracked Vehicles). This study, like most, assumes that the cost improvement coefficient (learning) for development has the same value realized in the production phase. Studies by SAIC (for NCA) and Technomics (for CEAC) indicate steeper slopes in EMD for Missile G&C sections and for IIR Seeker components. This, of course, has important methodological implications as increased use of modeling and simulation decreases the number EMD prototypes.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293

**Performer:** Naval Center for Cost Analysis  
Mr. Hardin and Dr. Nussbaum (703) 604-0293

**Resources:** Dollars:  
Staff-years: 1 Man-months

**Schedule:** Start: FY94  
End: FY94

**Data Base:** None

**Publications:** NCA Technical Report (unserialized), Jan 94

**Category:** II.D

**Keywords:** Industry, Estimating, Missiles, EMD, Production, Survey, Statistics/Regression, CER

**Title:** REVIC Calibration for Embedded, Ada and Non-Ada Projects

**Summary:** These reports use data presented in a MITRE Study (MTR1101) to develop revised coefficients for the REVIC software estimating model. Thiel's JASA article "On the use of Incomplete Prior Information in Regression Analysis", permit combining the default REVIC coefficients with the results of the current analysis.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Nussbaum (703) 604-0293

**Performer:** Naval Center for Cost Analysis  
Mr. Reisenleiter (703) 604-0287

**Resources:** Dollars:  
Staff-years: 2 Man-months

**Schedule:** Start: FY95  
End: FY95

**Data Base:** None

**Publications:** NCA Technical Reports 002-95 and 003-95, Jan 95

**Category:** II.D

**Keywords:** Government, Analysis, Estimating, Weapon Systems, EMD, Survey, Statistics/Regression, CER, Study

**Title:** VAMOSC Comparative Analysis

**Summary:** Perform a comparative analysis of Navy VAMOSC electronics data with its underlying data sources to determine if all relevant costs are included in the VAMOSC data. This entails comparing: VAMOSC-Air avionics data with Naval Aviation 3M data, Depot Master Component Rework Control (MCRC) data, and Naval Aviation Supply Office files; and comparing VAMOSC-Ships Maintenance Module (MM) data with 3M data for shipboard electronics. The comparative processes will be automated to facilitate future comparisons.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. J. Smuck (703) 604-0292

**Performer:** Information Spectrum, Incorporated R. Osseck

**Resources:** Dollars: \$67K  
Staff-years:

**Schedule:** Complete

**Data Base:** VAMOSC Electronics Data

**Publications:** Report

**Category:** II.A.1

**Keywords:** Government, Reviewing/Monitoring, Electronics/Avionics, Operations and Support, Data Collection, Study

**Title:** Electronics Initial Spares Costs

**Summary:** Collect data on initial spares for shipboard electronic systems and develop factors to use in estimating the cost of initial spares.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. J. Smuck (703) 604-0292

**Performer:** Cygnus Associates, Incorporated  
Mr. M. Moog (703) 425-5466

**Resources:** Dollars: \$40K  
Staff-years:

**Schedule:** Complete

**Data Base:** Shipboard Initial Spares Electronics Cost Data

**Publications:** Report

**Category:** II.A.1

**Keywords:** Government, Analysis, Electronics/Avionics, Production, Operations and Support, WBS, Data Collection, Data Base, Study



**Title:** Integration of Navy VAMOSC Data Base

**Summary:** There is a need to integrate the current weapon system Operating and Support (O&S) cost data into a relational database management system. Direct access to detailed and summary level data is also required. The current system of batch processing and paper report distribution is inefficient and incompatible with today's Navy systems

**Classification:** Unclassified.

**Sponsor:** Naval Center for Cost Analysis  
Mr. C. Wilbourn (703) 604-0310

**Performer:** Information Spectrum, Incorporated

**Resources:** Dollars: FY95 FY96 FY97  
\$200K \$200K \$200K  
Staff-years: 3

**Schedule:** Start: January 1995  
End: December 1997

**Data Base:** VAMOSC Ships and VAMOSC Air Data

**Publications:** Documentation of System

**Category:** II.B

**Keywords:** Government, Estimating, Weapon Systems, Operations and Support, Data Collection, Data Base

**Title:** Compilation of Detailed Navy VAMOSC Maintenance Data

**Summary:** Create a data base with VAMOSC raw data that provides maintenance cost by ship hull by Expanded Ship Work Breakdown Structure (ESWBS). This data base will provide visibility into operating and support costs at the level of detail not available in current standard VAMOSC reports.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. C. Wilbourn (703) 604-0310

**Performer:** NCA staff members

**Resources:** Dollars:  
Staff-years: 1 Manyear

**Schedule:** Start: May 1995  
End: December 1996

**Data Base:** VAMOSC Ships Maintenance and Repair Costs

**Publications:** Documentation of System

**Category:** II.B

**Keywords:** Government, Estimating, Ships, WBS, Operations and Support, Data Collection, Data Base

**Title:** Use of a Partial Adjustment Model for Explaining Changes in Overhead Rates

**Summary:** This research investigates the use of a "partial adjustment" model for explaining changes in overhead rates at selected U. S. shipyards. The underlying premise of the model is that firms have some desired level of overhead associated with a particular level of business base. Further, firms need more than one year to adjust actual levels to desired levels because of market, cultural, and institutional constraints.

**Classification:** Business Sensitive

**Sponsor:** Naval Center for Cost Analysis  
Dr. B. Flynn (703) 604-0301

**Performer:** Naval Center for Cost Analysis  
Dr. Brian Flynn and Mr. Harold Dagel (703) 604-0314

**Resources:** Dollars:  
Staff-years: In-House

**Schedule:** Start: April 1995  
End: July 1996

**Data Base:** Historical data on direct and indirect costs at several shipyards.

**Publications:** Written report

**Category:** I.B.2

**Keywords:** Industry, Estimating, Ships, Production, Overhead/Indirect, Mathematical Model, Study

**Title:** Development of a Life-Cycle Cost Analysis Course

**Summary:** This project will develop a life-cycle cost analysis course for the Cost Analysis Intern Program. Course materials will be developed and a two-week class presented.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Dr. Brian Flynn (703) 604-0301  
Dr. Dan Boger NPGS

**Performer:** Naval Center for Cost Analysis and Naval Post-Graduate School  
Dr. Brian Flynn (703) 604-0314  
  
Dr. Dan Boger

**Resources:** Dollars: \$60K to NPGS: one or two NCA Resources  
Staff-years:

**Schedule:** Start: September 1995  
End: January 1996

**Database:** Historical data on weapon system costs

**Publications:** Materials for classroom instruction

**Category:** I.B.2

**Keywords:** Government, Analysis, Weapon Systems, Life Cycle, Training

**Title:** Update of NCA's Z-Score Model

**Summary:** This research will update NCA's Z-Score Model for measuring the financial health of major Navy contractors. Advances in the literature will be reviewed. More current historical data will be gathered. Alternative model specifications will be proffered and a new model developed.

**Classification:** Unclassified.

**Sponsor:** Naval Center for Cost Analysis  
Dr. Brian Flynn (703) 604-0301

**Performer:** Naval Center for Cost Analysis  
Dr. Brian Flynn (703) 604-0314  
Mr. Harold Dagel (703) 604-0314

**Resources:** In-house effort

**Schedule:** Start: September 1995  
End: January 1996

**Database:** Historical financial data on bankrupt and non-bankrupt companies

**Publications:** Written report

**Category:** I.B.2

**Keywords:** Industry, Analysis, Data Collection, Mathematical Modeling, Method

**Title:** Update of NCA's Uncertainty Model

**Summary:** This project will review and update NCA's Uncertainty Model. Existing models and relevant research will be reviewed. The best features of present models will be incorporated into NCA's model.

**Classification:** Unclassified.

**Sponsor:** Naval Center for Cost Analysis  
Dr. Brian Flynn (703) 604-0301

**Performer:** Naval Center for Cost Analysis  
Dr. Brian Flynn (703) 604-0301  
Mr. Harold Dagel (703) 604-0314

**Resources:** In-house effort

**Schedule:** Start: January 1996  
End: June 1997

**Database:** None

**Publications:** Written report and computer software

**Category:** I.B.2

**Keywords** Government, Estimating, Risk/Uncertainty, Survey, Mathematical Model

**Title:** Cost Implications of Various Acquisition Strategies

**Summary:** This research will investigate the cost implications of various acquisition strategies such as: competitive procurement, multi-year procurement, down-selection to one contractor from a split-buy competitive environment.

Data will be gathered for different historical cases of weapon system procurement. Conversations will be held with program office personnel and with contract negotiators to ensure a full and complete understanding of programmatic issues and historical costs.

**Classification:** Unclassified, although some historical data could be business sensitive

**Sponsor:** Naval Center for Cost Analysis  
Dr. Brian Flynn (703) 604-0301

**Performer:** Naval Center for Cost Analysis  
Dr. Brian Flynn (703) 604-0301

**Resources:** In-house effort

**Schedule:** Start: January 1996  
End: December 1996

**Database:** Historical weapon system costs

**Publications:** Written report

**Category:** I.B.2

**Keywords:** Government, Analysis, Acquisition Strategy, Case Study, Study

**Title:** Investigation of Methods for Generating EACs

**Summary:** This research will investigate the accuracy of various methods for generating EACs on major Navy contracts. Revelant literature will be searched, including recent work by AFIT. The forecast accuracy of each estimator will be determined for various contract types, platform types, and stages of contract completion.

**Classification:** Unclassified, although some historical data could be business sensitive

**Sponsor:** Naval Center for Cost Analysis  
Dr. Brian Flynn (703) 604-0301

**Performer:** Naval Center for Cost Analysis  
Dr. Brian Flynn (703) 604-0301

**Resources:** In-house effort

**Schedule:** Start: June 1996  
End: December 1996

**Database:** Historical contract performance measurement data

**Publication:** Written report

**Category:** I.B.2

**Keywords:** Government, Estimating, Weapon Systems, CPR/CCDR, Study



**Title:** Development of Computer Hardware Price Indices and CERs for the Projection of New Computer Technology Capabilities

**Summary:** Development of price and performance CERs for computer hardware acquisition based on recent and projected improvements in performance/price ratios that will be used for estimating hardware costs in the period 1995/2010

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. S. Gross (703) 604-0277

**Performer:** Contractor TBD

**Resources:** Dollars: \$100K  
Staff-years: 6-9 Man-months

**Schedule:** Start: October 1995  
End: June 1996  
Start: June 1998

**Data Base:** To be collected

**Publications:** Investigate as appropriate

**Category:** II.A

**Keywords:** Industry, Estimating, Electronics/Avionics, Data Collection, Mathematical Modeling, CER

**Title:** Empirical Validation of Software Cost Estimation Models

**Summary:** This research evaluates four of the most popular algorithms used to estimate software costs (SASET, REVIC, Function Point, Feature Points) using data on 15 large completed business data processing projects. The purpose of this research is to assess to what extent the models show a quantitative need for calibration.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. S. Gross (703) 604-0277

**Performer:** Naval Center for Cost Analysis  
Mr. S. Gross

**Resources:** Dollars: \$120K  
Staff-years: 1 Manyear

**Schedule:** Start: October 1998  
End: June 1999

**Publications:** As appropriate

**Category:** II.A

**Keywords:** Industry, Estimating, Case Study, Review, Study

**Title:** Cost Implications of Schedule Slippages in Software Development Programs

**Summary:** Quantitatively evaluate the cost implications of schedule for 10, 25, 50, 100 percent slippages of the development schedule using the cost history of 30 programs. Perform a phase oriented (DoD 2167A) risk analysis of cost overruns due to schedule slippages to ascertain in which phases and to the extent schedule slippages are likely to occur.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. S. Gross (703) 604-0277

**Performer:** Contractor TBD

**Resources:** Dollars: \$125K  
Staff-years: 1 Manyear

**Schedule:** Start: October 1995  
End: June 1996

**Publication:** As appropriate

**Category:** II.A

**Keywords:** Government, Analysis, Life Cycle, Schedule, Risk/Uncertainty, Study

**Title:** Estimating Acquisition Reform Savings

**Summary:** This task supports ASN(FM)'s FY95 top priority for NAVCOSTCEN: active support of ASN(RD&A) acquisition reform executives by providing them information regarding cost analysis and cost estimating that they need to perform their mission. Specific task is incorporation of acquisition reform into future independent cost estimates.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis

**Performer:** Naval Center for Cost Analysis  
CDR Richard Heathcote & Team (702) 604-0284

**Resources:** Dollars:  
Staff-Years:      FY 95              FY 96  
                         0.7 Manyears      1.2 Manyears

**Schedule:** Start: April 1995  
End: TBD (ongoing effort)

**Data Base:** N/A

**Publications:** TBD

**Category:** II.A.1, II.A.2, II.C

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Life Cycle, Data Collection, Survey, Mathematical Modeling, Statistics/Regression

**Title:** Environmental Life Cycle Costs for Major Navy Weapon Systems

**Summary:** Identify and document current disposal practices of major Navy weapon systems. Explore existing costs of current technologies used in the disposal of major Navy weapon systems. Develop disposal cost databases and methodologies. Identify environmental life cycle costs not currently captured under existing in-house estimating techniques.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway Suite 400, West Tower  
Arlington, VA 22202

**Performer:** NCA, In-House (Environmental Cost Team)  
POC: Mr. Paul Hardin (703) 604-0290

**Resources:** Dollars:

Staff-Years:	<u>FY95</u>	<u>FY96</u>	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>
	0.8	2.0	2.0	2.0	2.0	2.0

**Schedule:** Start: May 1995  
End: FY00

**Data Base:** Unknown

**Publications:** Various NCA Technical Reports TBD

**Category:** I.C, II.B, II.C, and II.D

**Keywords:** Industry, Government, Estimating, Analysis, Weapon Systems, Facilities, Life Cycle, WBS, Overhead/Indirect, Environment, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

**Title:** Streamlining the ICE/CCA Process.

**Summary:** In an effort to become more versatile and responsive to customer requests, NCA has formed a Streamlining team which will investigate and recommend quality and efficiency improvements to the Independent Cost Estimate/Component Cost Analysis (ICE/CCA) process.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. J. Cherwonik (703) 604-0312

**Performer:** Naval Center for Cost Analysis  
Mr. J Cherwonik and Streamline Team members

**Resources:** Dollars:

Staff-Years: FY95 FY96  
2.25 0.75

**Schedule:** Start: January 1995  
End: January 1996

**Data Base:** TBD

**Publications:** Various

**Category:** II.B, II.C, II.D

**Keywords:** Government, Policy, Weapon Systems, Study

**Title:** Software Cost and Technical Glossary

**Summary:** Develop a list of over 300 computer hardware and software terms with their definitions. The glossary should give the name, acronym, definition and source of the definition. If more than one definition exists, these will also be listed.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

**Performer:** Naval Center for Cost Analysis  
Mr. Lowell Blagmon (703) 604-0274

**Resources:** Dollars:  
Staff-years: .5 Manyears

**Schedule:** Start: January 1995  
End: June 1995

**Database:** Software Glossary

**Publications:** TBD

**Category:** II.A.2

**Keywords:** Government, Analysis, Electronics/Avionics, Weapon Systems, Life Cycle, Data Collection, Data Base

**Title:** Software Technology and Life Cycle Primer

**Summary:** Develop a primer that reviews basic concepts of: software life cycle, software development standards, software development process, and software cost estimating. Include a review and comparison of MIL-STD 2167 vs MIL-STD 498.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

**Performer:** Naval Center for Cost Analysis  
CDR Ben Breaux (703) 604-0289

**Resources:** Dollars:  
Staff-years: .5 Manyears

**Schedule:** Start: January 1995  
End: June 1995

**Database:** Software Primer

**Publications:** TBD

**Category:** II.A.2

**Keywords:** Government, Analysis, Electronics/Avionics, Weapon Systems, Life Cycle, Survey, Study



**Title:** Software Cost Tracking Database

**Summary:** Develop a database composed of completed SW development estimates for Navy and Joint DoD programs. The database should include key cost, schedule, technical, program and development environment information as well as key assumptions used to perform the estimate. Develop a standard data collection form for cost analysts to use for future cost estimating efforts.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

**Performer:** TBD

**Resources:** Dollars: \$150K  
Staff-years: 1.5 Manyears

**Schedule:** Start: January 1996  
End: June 1996

**Database:** Software Cost Tracking Database

**Publications:** TBD

**Category:** II.A.2, II.C, II.D

**Keywords:** Government, Analysis, Electronics/Avionics, Weapon Systems, Life Cycle, Data Collection, Data Base

**AIR FORCE COST ANALYSIS AGENCY**

<b><i>Name</i></b>	Air Force Cost Analysis Agency		
<b><i>Address</i></b>	1111 Jefferson Davis Highway Crystal Gateway North, Suite 403 Arlington, VA 22202-4306		
<b><i>Director</i></b>	Col. Gordon Kage	(703) 604-0387	
<b><i>Size</i></b>	Professional:	51 (authorized)	
		38 (assigned)	
	Support:	2 (authorized)	
		0 (assigned)	
<b><i>Focus</i></b>	Independent weapon system and automated information system program cost estimating		
<b><i>Activity</i></b>	Number of projects in progress:	14	
	Average duration of a project:	.9 years	
	Average number of analysts assigned to a project:	1	
	Average number of staff-years expended per project:	.2	
	Percent of effort conducted by consultants:	90%	
	Percent of effort conducted by subcontractors:	0%	

**Title:** Avionics Systems Data Collection

**Summary:** The objective of this project is to update/develop a historical avionics data base to allow analysts to better understand and apply the data during subsequent cost estimating relationship (CER) development. Cost, technical, and programmatic data from the population of U.S. military weapons with on-board avionics systems, including those with integrated avionics architecture (vice federated) will be collected. The data will be validated and normalized. Sources of data, validation efforts, and normalization rationale will be completely documented. [This task was included in the 1994 catalog as AFCAA-4.]

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Capt. Grant McVicker (703) 602-9227/DSN 332-9227

**Performer:** Tecolote Research, Inc.

**Resources:** Dollars: FY94: \$275K  
FY95: \$250K

Staff-years:

**Schedule:** Start:  
End: January 1995, Follow-on: TBD

**Data Base:** The avionics systems data is contained in the Automated Cost Data base (ACDB) module of ACE IT. The data includes cost, programmatic and technical information generally at the LRU level. The following systems are included in the data base: APG65, APG 66, APG68, APG 70, APG 71, APG 73, ICAAS, AAQ-13, AAQ-14, ALR 67, ALR6M, ALR56C, ALQ 165, ALQ 135 and AYK 14.

**Publications:** TBD

**Category:** I.B, I.D, II.A, II.B

**Keywords:** Government, Analysis, Electronics/Avionics, EMD, Production, Labor, Materials, Data Collection, Data Base

**Title:** Composite/Exotic Materials Data base

**Summary:** The objective of this project is to develop a historical composite/exotic materials data base to allow analysts to better understand and apply the data during subsequent cost estimating relationship (CER) development. Cost, technical, and programmatic data for various weapon systems will be collected. The data will be validated and normalized. Sources of data, validation efforts, and normalization rationale will be completely documented. [This task was included in the 1994 catalog as AFCAA-5.]

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Brian Riddick (703) 602-9168,  
DSN 332-9168

**Performer:** Tecolote Research, Inc.

**Resources:** Dollars: FY94: \$150K  
FY95: \$150K  
Staff-years:

**Schedule:** Start:  
End: December 1994, Follow-on TBD

**Data Base:** FOXPRO based data base run out of ACDB. Provides detailed cost, technical and programmatic data on the following systems: AV-8B, F/A-18, F-22, B-2, V-22 and A-6.

**Publications:** 20 binders of raw data and 1 book summarizing efforts and results

**Category:** I.D, II.A, II.B, II.D

**Keywords:** Industry, Estimating, Analysis, Aircraft, Airframe, Material, Data Base

**Title:** O&S Cost Estimating Relationships (CERs) Development for Support Equipment

**Summary:** Project includes developing CERs for estimating Life-Cycle-Costs of support equipment for future weapon systems. These CERs will provide alternative methodologies for use in developing CCAs.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Maj. Mel Robertson (703) 604-0401  
DSN 664-00401

**Performer:** TBD

**Resources:** Dollars: FY95\$: 200K  
Staff-years:

**Schedule:** Start: November 1994  
End: December 1995

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A, II.B

**Keywords:** Government, Estimating, Analysis, Aircraft, Spares/Logistics, Life Cycle, Readiness, Data Collection, Mathematical Modeling, Statistics/Regression, CER, Data Base, Mathematical Model, Computer Model

**Title:** O&S Cost Estimating Relationships (CERs) Development for AVPOL

**Summary:** Project includes developing CERs for estimating "aviation POL" costs of future weapon systems. These CERs will provide alternative methodologies for use in developing CCAs. This project will be accomplished by in-house personnel. [This task was included in the 1994 catalog as AFCAA-7.]

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Brian Riddick (703) 606-9168  
DSN 332-9168

**Performer:** Air Force Cost Analysis Agency

**Resources:** Dollars: FY95  
\$5K  
Staff-years:

**Schedule:** Start: November 1994  
End: December 1995

**Data Base:** Excel-based data base containing detailed information on fuel consumption, weights, speeds, engine types and thrusts used to estimate AVPOL costs for future systems

**Publications:** CER for estimating fuel consumption

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Aircraft, Life Cycle, Data Collection, Mathematical Modeling, Statistics/Regression, CER, Data Base, Mathematical Model, Computer Model

**Title:** Aircraft Engine Data base

**Summary:** Project includes collection and analysis of cost, technical, and programmatic data for the development of an engine data base as well as the development of engine cost estimating relationships (CERs). These CERs will provide alternative methodologies for use in developing CCAs. This project will be accomplished by in-house personnel. [This task was included in the 1994 catalog as AFCAA-9.]

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Tina Colarossi (703) 602-9324  
DSN 332-9324

**Performer:** Air Force Cost Analysis Agency.

**Resources:** Dollars: FY95  
\$5K

Staff-years:

**Schedule:** Start: November 1994  
End: December 1995

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B, II.A, II.B

**Keywords:** Government, Estimating, Analysis, Aircraft, Engine, Life Cycle, Data Collection, Mathematical Modeling, Statistics/Regression, CER, Data Base, Mathematical Model, Computer Model



**Title:** Composite Material Support Cost Data base

**Summary:** The objective of this project is to attempt to determine, using historical data, whether additional support costs are incurred (and their magnitude) because of the use of composite/exotic materials. A data base of support costs specific to composite materials will be developed. This will allow analysts to better understand and apply the data during subsequent cost estimating relationship (CER) development. Support cost information for various weapon systems employing high percentages of composite materials will be collected. The data will be validated, normalized, and compared to support costs for conventional materials. Sources of data, validation efforts, and normalization rationale will be completely documented. [This task was included in the 1994 catalog as AFCAA-10.]

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency  
Capt. Grant McVicker (703) 602-9227  
DSN 332-9227

**Performer:** TBD

**Resources:** Dollars: FY96: \$250K  
Staff-years:

**Schedule:** Start: October 1995  
End: December 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A, I.B, II.B, II.C.

**Keywords:** Government, Estimating, Analysis, Aircraft, Airframe, Spares/Logistics, Life Cycle, Readiness, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER, Mathematical Model, Computer Model

**Title:** Lean Manufacturing & New Material Concepts

**Summary:** The objective of this project is to develop knowledge and cost data bases through contractor discussions and fact-findings on lean manufacturing, stereo lithography, computer aided technical information systems, and the paperless factory. The information concerning these concepts will be collected, reviewed, and compared to historical actuals. This effort will allow analysts to better understand and estimate the cost impacts of these concepts, which are receiving attention at high levels within both DoD and industry. Sources of data, validation efforts, and normalization rationale will be completely documented. [This task was included in the 1994 catalog as AFCAA-11.]

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency

Tina Colarossi (703) 602-9324  
DSN 332-9324

**Performer:** TBD

**Resources:** Dollars: FY96: \$250K  
Staff-years:

**Schedule:** Start: October 1995  
End: December 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A, I.B, II.B, II.D.

**Keywords:** Government, Analysis, EMD, Production, Labor, Materials, Data Collection, Data Base

**Title:** Aircraft Modification Programs Study

**Summary:** Data collection on modifications to aircraft to include modifications done on commercial aircraft, military aircraft, software updates, and test and evaluation data. SOW will include an analysis of what program data is available.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Carol Hibbard (703) 604-0403  
DSN 664-0403

**Performer:** TBD

**Resources:** Dollars: FY97: \$250K  
Staff-years:

**Schedule:** Start: December 1996  
End: December 1997

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A, I.B, II.B, II.D

**Keywords:** Government, Estimating, Analysis, Aircraft, Modification, Test and Evaluation, Data Collection

**Title:** Aircraft Data base Study Follow-On

**Summary:** Collect, analyze, and organize historical cost data for the following aeronautical programs: C-5, C-17, B-1, B-2, F-22, JSTARS.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Tina Colarossi (703) 602-9324  
DSN 332-9324

**Performer:** TBD

**Resources:** Dollars: FY96: \$250K  
Staff-years:

**Schedule:** Start: December 1996  
End: December 1997

**Data Base:** ACDB

**Publications:** TBD

**Category:** I.D, II.A

**Keywords:** Government, Estimating, Analysis, Life Cycle, Data Collection, Mathematical Modeling, Statistics/Regression, CER, Data Base, Computer Model.

**Title:** O&S Cost Estimating Relationships (CERs) Development for DLRs, PDM and Engine Overhaul

**Summary:** Project includes developing CERs for estimating costs of depot level reparable, programmed depot maintenance and jet engine overhaul for future weapon systems. These CERs will provide alternative

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Maj. Mel Robertson (703) 604-0401  
DSN 664-0401

**Performer:** Logistics Management Institute (LMI)

**Resources:** Dollars: FY95: \$205K  
Staff-years:

**Schedule:** Start: March 1994  
End: July 1995

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A., II.B

**Keywords:** Government, Estimating, Analysis, Aircraft, Spares/Logistics, Life Cycle, Readiness, Data Collection, Mathematical Modeling, Statistics/Regression, CER, Data Base, Mathematical Model, Computer Model

**Title:** O&S Cost Estimating Relationships (CERs) Development for BMS and Sustaining Engineering

**Summary:** Project includes developing CERs for estimating costs of base maintenance supplies and sustaining engineering for future weapon systems. These CERs will provide alternative methodologies for use in developing CCAs..

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Maj. Mel Robertson (703) 604-0401  
DSN 664-0401

**Performer:** TBD

**Resources:** Dollars: FY96: \$200K  
Staff-years:

**Schedule:** Start: December 1995  
End: December 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A, II.B

**Keywords:** Government, Estimating, Analysis, Aircraft, Spares/Logistics, Life Cycle, Readiness, Data Collection, Mathematical Modeling, Statistics/Regression, CER, Data Base, Mathematical Model, Computer Model

**Title:** C3 Platform Integration Data Base

**Summary:** The objective of this project is to collect costs, labor hours, technical data, programmatic data, and develop a consolidated data base for recent C3 acquisition programs involving platform integration efforts, both ground and airborne. In addition, this project will develop cost estimating relationships (CERs) and, or a model from this data base.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Capt. Mike Volk (703) 604-0408  
DSN 664-0408

**Performer:** TBD

**Resources:** Dollars: FY95: \$120K  
FY96 \$120K  
FY97 \$120K  
FY98 \$120K

Staff-years:

**Schedule:** Start: June 1995  
End: September 1998

**Data Base:** As described in Summary section

**Publications:** TBD

**Category:** I.B, II.A

**Keywords:** Government, Analysis, Electronics/Avionics, Data Collection, Data Base, EMD, Production

**Title:** C3 Hardware Maintenance Data Base

**Summary:** The objective of this project is to collect maintenance costs and labor hours, reliability data, technical data, and programmatic information on existing C3 LRUs and SRUs.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Maj Don Markel (703) 604-0405  
DSN 664-0405

**Performer:** TBD

**Resources:** Dollars: FY95: \$100K  
FY96: \$120K  
Staff-years:

**Schedule:** Start: June 1995  
End: September 1996

**Data Base:** As described in Summary section

**Publications:** TBD

**Category:** II.A

**Keywords:** Government, Analysis, Electronics/Avionics, Data Collection, Data Base, Operations and Support



**Title:** SEPM Data Base & CERs

**Summary:** The objective of this project is to build a data base and CERs from historical EMD and production contracts based on manloading and period of performance plus any other supporting information/data. Efforts in FY 97 and 98 expand the data base and refine the CERs.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Capt. Mike Volk (703) 604-0408  
DSN 664-0408

**Performer:** TBD

**Resources:** Dollars: FY96: \$180K  
FY97: \$180K  
FY98: \$180K  
Staff-years:

**Schedule:** Start: October 1995  
End: September 1998

**Data Base:** As described in Summary section

**Publications:** TBD

**Category:** I.B, II.A, II.B

**Keywords:** Government, Analysis, Electronics/Avionics, Data Collection, Data Base, EMD, Production

**Title:** C3 Depot Level Repairables (DLR) Model

**Summary:** This project develops a model, cost estimating relationships (CERs) to estimate the cost of Depot Level Repairables (DLRs) for C3 LRUs. The model variables would include MTBF, MTBR, unit cost, number of SRUs, and others as appropriate.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Maj Don Markel (703) 604-0405  
DSN 664-0405

**Performer:** TBD

**Resources:** Dollars: FY97 FY98  
\$180K \$120K  
Staff-years:

**Schedule:** Start: October 1996  
End: September 1998

**Data Base:** As described in Summary section.

**Publications:** TBD

**Category:** II.A

**Keywords:** Government, Analysis, Electronics/Avionics, Data Collection, Data Base, Operations and Support

**Title:** SEPM Estimating Handbook

**Summary:** Develop a cost estimating handbook/tutorial to assist cost personnel in estimating SEPM. It would include detailed descriptions of models, techniques, best practices, data sources, phasing methodologies, data, etc.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Lt Elias Voces (703) 604-0407  
DSN 664-0407

**Performer:** TBD

**Resources:** Dollars: FY96  
\$100K  
Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** As described in Summary section

**Publications:** TBD

**Category:** II.A

**Keywords:** Government, Analysis, Electronics/Avionics, Data Collection, Data Base, EMD, Production

**Title:** Munitions Seeker Data Collection

**Summary:** The objective of this project is to develop a technical & cost data base on new munitions using new seeker technology (IR Focal Plane Array, millimeter wave, dual mode seekers, synthetic aperture array, K-band RF, etc.). This will insure estimators have data to perform estimates on weapon systems with new seeker technology. Sources of data, validation efforts, and normalization rationale will be completely documented.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency

Ms. Theresa O'Brien (703) 604-0394  
DSN 664-0394

**Performer:** TBD

**Resources:** Dollars: FY96  
\$300K

Staff-years:

**Schedule:** Start: October 1995  
End:

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A.1

**Keywords:** Government, Analysis, Electronics/Avionics, EMD, Production,  
Labor, Material, Data Collection, Data Base

**Title:** Missiles/Munitions ACDB Update

**Summary:** The objective of this project is to collect the necessary data to perform periodic updates of the Automated Cost Data Base (ACDB) to include the latest data on programs such as JDAM, AIM-9X and Sensor Fused Weapon. Update ACDB with the new data.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Financial Management Missiles

**Performer:** TBD

**Resources:** Dollars:    FY97    FY00  
                     \$150K    \$150K

Staff-years:

**Schedule:** Start:   October 1996                      October 1999  
                 End:   May 1997                      May 2000

**Data Base:** Automated Cost Data Base (ACDB). Description: Missiles and Munitions systems data

**Publications:** TBD

**Category:** II.A.1

**Keywords:** Government, Analysis, Programming, Missiles, Forces, Mathematical Modeling, Computer Model, Life Cycle, Labor, Material, Data Collection, Data Base

**Title:** Missiles/Munitions SE/PM CER Development

**Summary:** The objective of this project is to take data from the Automated Cost Data Base (ACDB) and other sources and develop CERs to estimate SE/PM costs for missile/munitions programs in development as well as production.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Financial Management Missiles

**Performer:** TBD

**Resources:** Dollars:    FY98    FY01  
                     \$100K   \$100K  
Staff-years:

**Schedule:** Start:   October 1997                    October 2000  
End:   April 1998                    April 2001

**Data Base:** Automated Cost Data Base (ACDB)  
Description:    Missiles and Munitions Systems Data  
Automation:    PC in FoxPro

**Publications:** TBD

**Category:** II.A.2, II.B

**Keywords:** Government, Analysis, Missiles, EMD, Production, Data Collection, Data base, Mathematical Modeling, Statistics/Regression, CER, Computer Model

**Title:** Munitions/Seeker CER Development

**Summary:** The objective of this project is to use data from Munitions Seeker Data Collection (funded and delivered in FY96) to develop Cost Estimating Relationships to estimate the development and production of seeker components.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Financial Management Missiles  
Mr. Boyd (703) 604-0395

**Performer:** TBD

**Resources:** Dollars: FY97  
\$150K  
Staff-years:

**Schedule:** Start: October 1996  
End: March 1997

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A.2, II.B

**Keywords:** Government, Analysis, Electronics/Avionics, Data Collection, Data base, Mathematical Modeling, Statistics/Regression, CER, Labor, Material, Overhead/Indirect

**Title:** Missiles/Munitions ST&E CER Development

**Summary:** The objective of this project is to take data from the Automated Cost Data Base (ACDB) and other sources and develop regressions to estimate ST&E costs for missile/munitions programs in development as well as production.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Financial Management Missiles

**Performer:** TBD

**Resources:** Dollars:    FY98    FY01  
                     \$100K    \$100K

                     Staff-years:

**Schedule:** Start: October 1997, October 2000  
End: April 1998, April 2001

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A.2, II.B

**Keywords:** Government, Analysis, Data Collection, Data base, Mathematical Modeling, Statistics/Regression, CER, Test and Evaluation, Missiles, Labor, Material, Overhead/Indirect



**Title:** Missiles/Munitions O&S CER Update

**Summary:** The objective of this project is to update the report from the FY95 data collection and CER effort for Missiles and Munitions Operating and Support Costs.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Financial Management Missiles

**Performer:** TBD

**Resources:** Dollars: FY02  
\$180K  
Staff-years:

**Schedule:** Start: October 2001  
End: October 2002

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A.2, II.B

**Keywords:** Government, Analysis, Data Collection, Data base, Mathematical Modeling, Statistics/Regression, CER, Operations and Support, Missiles

**Title:** Software "Growth" Feasibility Study

**Summary:** An effort to quantify growth in software size during development by reviewing existing documentation on program estimates at different milestones. To include both MIS, C4I and embedded software systems. A relatively small preliminary study to determine the feasibility of a more in-depth data collection effort by assessing the availability of relevant data from a variety of sources (OSD PA&E, NCA, AFCAA, USACEAC, et. al.). Includes an option to actually collect data if data is readily available and collection is economically feasible. The objective is attempt to develop credible size adjustment factors that can be used to modify size inputs to effort estimation models and/or to assess size growth risk.

**Classification:** Unclassified, Public Domain

**Sponsor:** Air Force Cost Analysis Agency

Mr. John B. Donald, (703) 604-0412  
DSN 664-0412  
donald@afcaapo.afcaanet.hq.af.mil

**Performer:** SAIC - Washington

**Resources:** Dollars: FY95: \$25K Feasibility Study  
FY96: \$50K Data Collection

Staff-years:

**Schedule:** Start: July 1995 - Feasibility Study  
March 1996 - Data Collection and Analysis  
(Effort may be accelerated)

End:

**Data Base:** Data base of software size estimates at various program milestones for a variety of domains (MIS, C4I and embedded).

**Publications:** Historic Size Growth During Software Development

**Category:** II.A., II.D.

**Keywords:** Industry, Government, Estimating, Size, Data Collection, Data Base

**Title:** Software Functional-Based Size Estimating Method - Domain and Functional Software Taxonomy

**Summary:** Identification of DoD software domains with an inventory/taxonomy of software functionality for each domain. This is a preliminary step toward revising the existing SASET Functional Sizer and SMC Software Data base for estimating software size by analogy early in program development. The objective is to develop a complete taxonomy of typical software functionality linked to actual sizes for similar completed projects. By selecting functionality required in the new system, the analyst will be able to develop more credible estimates of software size before specific programmatic characteristics are known. Will also assist analysts by providing a basis for interacting with the program office or developer to insure that all software functionality is being considered in the estimate. This product will standardize the characterization of software data records in existing and future data bases by providing a common basis for describing the functionality of each software component. The resulting product will be implemented in the SoftEST Software Estimating tool. This is a limited scope effort that will be used as the basis for further enhancement by domain experts.

**Classification:** Unclassified, Public Domain

**Sponsor:** Air Force Cost Analysis Agency

Mr. John B. Donald (703) 604-0412  
DSN 664-0412  
donald@afcaapo.afcaanet.hq.af.mil

**Performer:** SAIC - Washington

**Resources:** Dollars: FY95  
\$50K

Staff-years:

**Schedule:** Start: December 1995

End:

**Data Base:** None

**Publications:** A Taxonomy of DoD Software Functionality by Domain

**Category:** I.B, II.A, II.B, II.D

**Keywords:** Government, Estimating, Analysis, Size, Study

**Title:** Software Size Estimating Methods Study

**Summary:** A technical review of existing software size measures focusing on source lines of code (SLOC), function points (FP) and possibly object points (OP). The objective is to identify strengths and weaknesses of each as both a measure and an estimator of software size. Will also identify when each measure can/should be used, the applicability of each measure in different software domains, and limitations associated with each measure. Will extend efforts initiated by AFCAA staff and others to describe each measure and document its usefulness to DoD software estimating and measurement.

**Classification:** Unclassified, Public Domain

**Sponsor:** Air Force Cost Analysis Agency  
Mr. John B. Donald (703) 604-0412  
DSN 664-0412  
donald@afcaapo.afcaanet.hq.af.mil

**Performer:** Management Consulting and Research (prime contractor)  
Software Productivity Consortium (subcontractor)

**Resources:** Dollars: FY95  
\$100K  
Staff-years:

**Schedule:** Start: December 1995  
End:

**Data Base:** TBD

**Publications:** A Technical Description and Review of Software Size Measures

**Category:** I.B, II.A, II.B, II.D

**Keywords:** Government, Estimating, Analysis, Size, Study

**Title:** Neural Network Analysis of Historic Software Development Data

**Summary:** This effort will apply neural network analysis expert systems technology to available software development data to determine whether logical but non-statistical relationships exist that can be used as alternate methods for estimating software development effort and/or schedule. Initial effort will focus on analysis of existing data to identify possible relationships within the data and to "train" the neural network algorithm(s). Subsequent efforts will attempt to apply the "trained" algorithm to estimate the effort and schedule of completed software development efforts. If credible estimating relationships are identified, a neural network estimating model will subsequently be developed.

**Classification:** Unclassified, Public Domain

**Sponsor:** Air Force Cost Analysis Agency

Mr. John B. Donald (703) 604-0412  
DSN 664-0412  
donald@afcaapo.afcaanet.hq.af.mil

**Performer:** Air Force Cost Analysis Agency (John B. Donald)

**Resources:** Dollars: FY95  
\$1K

Staff-years:

**Schedule:** Start: TBD  
End:

**Data Base:** None

**Publications:** Application of Neural Network Analysis to Software Estimating

**Category:** I.B, II.B, II.D.

**Keywords:** Government, Estimating, Analysis, Expert Systems

**Title:** Software Estimating Process Study - Generic Estimating Question Set

**Summary:** Development of a standard generic set of questions to be used by cost analysts to obtain necessary information to perform a credible software estimate. Attempt to convert existing subjective project attributes to more measurable and quantitative measures. To be used in SoftEST estimating tool to support development of generic data sets that can be translated into the proper settings for a variety of different estimating models.

**Classification:** Unclassified, Public Domain

**Sponsor:** Air Force Cost Analysis Agency  
Mr. John B. Donald (703) 604-0412  
DSN 664-0412  
donald@afcaapo.afcaanet.hq.af.mil

**Performer:** SAIC - Washington

**Resources:** Dollars: FY95  
\$35K  
Staff-years:

**Schedule:** Start:  
End: December 1995

**Data Base:** None

**Publications:** Software Estimating Data Collection Question Set

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Data Collection, Study

**Title:** Software Data Collection

**Summary:** Screening and collection of 1000+ completed software development efforts that used the Ada programming language and support environments as well as data on projects that used other software engineering techniques such as 4GLS and object oriented techniques. FY94 effort focuses on screening Ada Joint Program Office data base of completed Ada projects to characterize and qualify the programs on selected attributes. FY95 and subsequent efforts will focus on collecting data as required to meet specific estimating and analysis objectives. The data will be used to calibrate software estimating models, for quantitative assessment of Ada programming language and other special studies, and development of new estimating factors and algorithms. Data will be contributed to National Software Data and Information Repository (NSDIR) and SMC Software Data Base.

**Classification:** Unclassified, Public Domain

**Sponsor:** Air Force Cost Analysis Agency  
Mr. John B. Donald (703) 604-0412  
DSN 664-0412  
donald@afcaapo.afcaanet.hq.af.mil

**Performer:** FY95 Data Screening SAIC - Washington  
FY95+ Data Collection TBD

**Resources:** Dollars: FY94: \$35K AJPO Stat Screening  
FY95: \$100K Data Collection  
Staff-years:

**Schedule:** Start:  
End: AJPO Data Screening Oct 95  
FY95 Data Collection Jan 96

**Data Base:** Software Development Data (Contributed to NSDIR and SMC SW)

**Publications:** None

**Category:** I.D, II.A

**Keywords:** Government, Estimating, Analysis, Data Collection, Data Base



**Title:** Expert Systems for Software Estimating

**Summary:** Application of expert system technology to estimating software. The objective is to capture the skill and knowledge of highly skilled software cost analysts and provide it in an easily used format. Initial effort will focus on developing an expert system to assist analysts in specifying the software development environment parameters. Subsequent opportunities to apply expert systems technology will be considered in relation to software size and schedule estimating. Primary effort for FY96 focuses on knowledge engineering.

**Classification:** Unclassified, Public Domain

**Sponsor:** Air Force Cost Analysis Agency

Mr. John B. Donald (703) 604-0412  
DSN 664-0412  
donald@afcaapo.afcaanet.hq.af.mil

**Performer:** TBD

<b>Resources:</b>	Dollars:	<u>Unfunded FY 96</u>	<u>FY97</u>
		\$300K	\$300K

Staff-years:

**Schedule:** Start: TBD

End:

**Data Base:** None

***Publications:*** TBD

**Category:** I.D., II.A

**Keywords:** Government, Estimating, Analysis, Expert Systems, Study

**Title:** SoftEST Software Estimating Tool

**Summary:** A generic software estimating tool that integrates the REVIC, COCOMO/COCOMO 2, and SASET software estimating models with appropriate software size estimating tools, and extensive user help/guidance. The primary objective of SoftEST is to serve as a backplane for development and implementation of existing and future software estimating techniques. Additionally, use of a generally accepted software estimating process coupled with extensive user help will facilitate development of more consistent and credible estimates. The third objective is to serve as a standard "front-end" to a variety of commercial estimating models to facilitate use of multiple estimating models without the need to rebuild the estimate in each model.

**Classification:** Unclassified, Public Domain

**Sponsor:** Air Force Cost Analysis Agency

Mr. John B. Donald (703) 604-0412  
DSN 664-0412  
donald@afcaapo.afcaanet.hq.af.mil

**Performer:** R.K.K. Enterprises

**Resources:** Dollars: FY94 FY95 FY96 FY97  
\$436K \$150K \$200K TBD

Staff-years:

**Schedule:** Start:

End: SoftEST Version 1.0 December 1995  
SoftEST Version 2.0 July 1996

**Data Base:** None

**Publications:** None

**Category:** I.B, II.A, II.B

**Keywords:** Government, Estimating, Analysis, Mathematical Model,  
Computer Model

**Title:** Software Performance Measurement System

**Summary:** Completion and revision of a unique tool for measuring developer performance on software development efforts. Essentially a "software C/SCSC system." Expansion and improvement of existing Software Performance Measurement Model originally developed by Martin Marietta as part of SASET software estimating model. To be implemented as part of SoftEST Software Estimating Tool.

**Classification:** Unclassified, Public Domain

**Sponsor:** Air Force Cost Analysis Agency  
Mr. John B. Donald (703) 604-0412  
DSN 664-0412  
donald@afcaapo.afcaanet.hq.af.mil

**Performer:** SAIC - Washington and R.K.K. Enterprises

**Resources:** Dollars: FY94  
\$75K  
Staff-years:

**Schedule:** Start:  
End: October 1995

**Data Base:** None

**Publications:** None

**Category:** I.D

**Keywords:** Government, Estimating, Analysis, Study

**Title:** Activity-Based Software Estimating Methodology

**Summary:** Development of a new methodology for estimating software development and support that breaks-down the software development/support process into more discrete activities or functions that can be estimated using techniques other than the "size" (SLOC, FP) of the product. Extends the concept of the SASET estimating methodology and emulates an engineering build-up approach to software estimating

**Classification:** Unclassified—Public Domain

**Sponsor:** Air Force Cost Analysis Agency

Mr. John B. Donald (703) 604-0412  
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donald@afcaapo.afcaanet.hq.af.mil

**Performer:** TBD

**Resources:** Dollars: FY97+  
\$500K

Staff-years:

**Schedule:** Start: FY97+  
End:

**Data Base:** None

**Publications:** None

**Category:** I.B, II.D

**Keywords:** Government, Estimating, Analysis, Method

**Title:** Post-Deployment Software Support (PDSS) Estimating Methods Study

**Summary:** A formal assessment of existing Post Deployment Software Support (PDSS) estimating methods for relevance, usefulness and credibility. Initial effort to document capabilities, assumptions and methodology of existing techniques. Subsequent effort to assess existing models in relation to current and future estimating requirements and recommend alternative PDSS estimating methods. Addresses perceived lack of credibility of existing PDSS estimating methods based extensively on original development effort and "annual change traffic." Includes relevant data collection where necessary.

**Classification:** Unclassified—Public Domain

**Sponsor:** Air Force Cost Analysis Agency  
Mr. John B. Donald (703) 604-0412  
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**Performer:** TBD

**Resources:** Dollars: 

<u>FY96</u>	<u>FY97+</u>
\$100K	\$100K

  
Staff-years:

**Schedule:** Start: TBD  
End:

**Data Base:** PDSS Effort Data base

**Publications:** Description and Assessment of Software PDSS Estimating Methods

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Study

**Title:** Space System Data base Consolidation (Phase I)

**Summary:** Phase I of this project will establish a NASA/AF standard WBS and cost data normalization procedures. This project will update the existing government cost data base which will be the basis of cost estimating relationship (CER) development. Phase II will use the consolidated data base WBS and normalization procedures. Future phases call for the re-normalizing of several of the current space system data packages (candidates: Gama Ray Observatory, HUBBLE, DSCS III). The most complete data packages will be re-normalized. The effort will include narrative summary of each data point (program resume), a description of relevant technical and physical parameters, and detailed data spreadsheets with raw data, and normalized data. Phase III of this project will add new data packages.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Scott Boyd GS-13, USAF

**Performer:** Tecolote, MCR

**Resources:** Dollars: FY95  
\$100K  
Staff-years:

**Schedule:** Start: January 1995  
End: January 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** I.D, II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

**Title:** Launch Vehicle Cost Model (LVCM) Expansion

**Summary:** This project will expand and maintain the current version of the LVCM, to include system level data and develop common NASA/AF format. The objective is to plan and initiate data collection and CER development effort. The effort will update the existing data and develop CERs from the data. The effort will begin to develop methods for estimating modification derivative launch vehicle systems.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Michael Peters, GS-14, 703-604-0395

**Performer:** Tecolote

**Resources:** Dollars: FY95  
\$166K

Staff-years:

**Schedule:** Start: June 1995  
End: January 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** IA, I.B, II.A

**Keywords:** Government, Estimating, Analysis, Space Systems,  
Spares/Logistics, Life Cycle, Data Collection, Data Base,  
Mathematical Modeling, Statistics/Regression

**Title:** Communications Payload Data Collection and Data base Development

**Summary:** This project is the data collection and data base development effort for the purpose of estimating communications payload. Technological advances will also be examined. Existing data bases at SMC, NASA, and other government agencies will be reviewed. This effort will also include development of a standard NASA/AF WBS structure and definitions for communications payload; and identifying and characterizing technical and performance cost drivers; and consolidating and formatting the data into COSTAT and NASCOM formats. The effort includes developing program resumes to explain the data collected and unique elements for each program.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Major Carpio (703) 602-9282

**Performer:** TBD

**Resources:** Dollars: FY95  
\$125K  
Staff-years:

**Schedule:** Start: June 95  
End: January 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., II.A, II.B.

**Keywords:** Government, Estimating, Analysis, Space Systems, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression



**Title:** Sensor Payload Data Collection and Data base Development

**Summary:** This project is the data collection and data base development effort for the purpose of estimating sensor payload. Technological advances will also be examined. Existing data bases at SMC, NASA, and other government agencies will be reviewed. The project will review contractor business base so the impact of changes in labor rates and overhead rates can be assessed. This effort will also include development of a standard WBS structure and definitions for sensor payload; and identifying and characterizing technical and performance cost drivers; and consolidating and formatting the data into COSTAT and NASCOM formats. The effort includes developing program resumes to explain the data collected and unique elements for each program.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Lt D. Carroll 703-602-9315

**Performer:** TBD

**Resources:** Dollars: FY95  
\$150K  
Staff-years:

**Schedule:** Start: June 1995  
End: January 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., I.D, II.A, II.B

**Keywords:** Government, Estimating, Analysis, Space Systems, Spares/Logistics, Life Cycle, Labor, Overhead/Indirect, WBS, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

**Title:** Space System Data base Consolidation (Phase II)

**Summary:** This project involves the re-normalizing of several of the current space system data packages (candidates: Gama Ray Observatory, HUBBLE, DSCS III) based on the Phase I NASA/AF standard data base WBS and normalization procedures. The effort will include narrative summary of each data point (program resume), a description of relevant technical and physical parameters, detailed data spreadsheets with raw data and normalized data. Phase III of this project will add new data packages. This project is essential to the completion of the goal to achieve overall consistency in current and future satellite data bases.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency  
Scott Boyd, GS-13 (703-602-9265)

**Performer:** TBD

**Resources:** Dollars: FY96  
\$250K

Staff-years:

**Schedule:** Start: January 1996  
End: September 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** I.D., II.A

**Keywords:** Government, Estimating, Analysis, Life Cycle, Readiness, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER, Computer Model

**Title:** Streamlined Acquisition Cost Study

**Summary:** This project examines the cost impact and the factoring of streamlined acquisition. It will examine Mil-Spec applications for contractors and subs, program h/w procurement routines, CAE/CAD/CAM applications, management information network, contract changes, implementation of commercial manufacturing and quality controls, reduction of program reviews and reporting, parts application flexibility, shared benefits of IR&D, automated test data handling systems, reduction of government micro-management, design-to-cost potentials, contract type, multi-year procurement, combined build concepts, and long lead parts procurement. Any and all major contributors to streamlined acquisition process and their impact on cost estimating methods will be examined.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency  
Major R. Carpio (703-602-9282)

**Performer:** TBD

**Resources:** Dollars: FY96  
\$250K

Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A

**Keywords:** Government, Estimating, Analysis, Life Cycle, Readiness, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER, Computer Model

**Title:** Satellite Storage Cost

**Summary:** This project will provide a data base and cost model to estimate satellite storage costs. Whether it be launch schedule delays, or programmatic, there are costs associated in storing manufactured satellites. This project involves the data collection on satellite storage costs. The data collected will be consistent with the NASA/AF standard WBS and standard normalization procedures. Possible candidates include, but not limited to, DSCSIIB, and GPS.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency  
Ms. Ranae Pepper, GS-13, 703-602-9333

**Performer:** TBD

**Resources:** Dollars: FY96: \$120K  
Staff-years:

**Schedule:** Start: October 1995  
End: June 1996

**Data Base:** None

**Publications:** TBD

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Spares/Logistics, Life Cycle, Readiness, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER, Computer Model

**Title:** Booster/Payload Interface Standard

**Summary:** This project will analyze the cost impact of standardizing the interface between the booster and the payload industry-wide in anticipation of Evolved Expendable Launch Vehicle (EELV) development. To achieve cost reduction and streamlining, standardization of boosters and payload interfaces will be common place. The project will consider the industry and DoD impacts of accommodating the standardization from the booster and the payload perspective. It will encompass the pre-EMD, EMD, and Production phases.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency  
Capt Tom O'Hara, (703) 602-9255

**Performer:** TBD

**Resources:** Dollars: FY96  
                  \$\$150K

Staff-years:

**Schedule:** Start: October 1995  
End: June 1996

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A, I.B, II.A, II.B.

**Keywords:** Government, Estimating, Analysis, Space Systems,  
Spares/Logistics, Life Cycle, Data Collection, Data Base,  
Mathematical Modeling, Statistics/Regression, CER, Computer  
Model

**Title:** Space System Data base Consolidation (Phase III)

**Summary:** This project is the last Phase of a three-phased effort. Phase I of this project established the standard WBS and cost data normalization procedures. Phase II used the NASA/AF common data base WBS and normalization procedures to renormalize several of the current space system data packages. Phase II included narrative summary of each data point (program resume), a description of relevant technical and physical parameters, and detailed data spreadsheets with raw data, and normalized data. Phase III of this project will add new data packages using the same processes as used in Phase II.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency  
Scott Boyd, GS-13 (703) 602-9265

**Performer:** TBD

**Resources:** Dollars: FY97  
\$150K

Staff-years:

**Schedule:** Start: October 1996  
End: June 1997

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Life Cycle, Readiness, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER, Computer Model

**Title:** Common Bus Data Collection

**Summary:** This project involves the data collection on satellite common bus. Common bus will be/may be the industry norm to place specific payloads into orbit. Data collection will involve the collection of past and current common bus, both commercial and DoD satellites. The data collected will be consistent with the NASA/AF standard WBS and standard normalization procedures. Possible candidates include, but not limited to, Hughes 601, TRW AB1200, Loral and LMSC common bus.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency  
Capt Tom O'Hara (703) 602-9256

**Performer:** TBD

**Resources:** Dollars: FY97  
\$100K

Staff-years:

**Schedule:** Start: October 1996  
End: May 1997

**Data Base:** TBD

**Publications:** TBD

**Category:** I.D, II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Life Cycle, Readiness, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER, Computer Model

**Title:** Re-Engineering Space Cost Estimating

**Summary:** This project will examine the process of space cost estimating. (This is NOT the re-engineering or re-visit of the space acquisition associated with streamlining.) This effort specifically addresses the current space cost estimating methodology and the re-engineering of space cost estimating. This re-engineering is necessary to increase the ability and capability of the AFCAA to conduct Component Cost Analyses. By this effort, the AFCAA will improve the process of cost estimating. If at the DoD level, acquisition is under re-engineering, it is necessary for the space cost estimating to adapt to the changing environment.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY97  
\$100K

Staff-years:

**Schedule:** Start: October 1996  
End: June 1997

**Data Base:** TBD

**Publications:** TBD

**Category:** II.B., II.D

**Keywords:** Government, Estimating, Analysis, Space Systems, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER, Mathematical Model, Computer Model



**Title:** Launch Vehicle Data base Update

**Summary:** This project will develop cost estimating relationships (CERs) from existing cost data bases. It will provide the cost estimating tools to estimate accurately launch vehicle costs. The CERs will be tested against actual data for validation and reasonableness.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY97  
\$250K  
Staff-years:

**Schedule:** Start: October 1996  
End: June 1997

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Spares/Logistics, Life Cycle, Mathematical Modeling, Statistics/Regression, Data Collection, Data Base, CER, Mathematical Model, Computer Model

**Title:** Business Base Impact Cost Study Follow-On

**Summary:** This project will re-examine the cost impact of the changing business base due to DoD downsizing and other economic environmental factors. It will examine several major aerospace corporations' experiences and corporate strategies. This project will help the estimating process by reflecting the current state of corporate business base decisions.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY97  
\$100K

Staff-years:

**Schedule:** Start: October 1996

End: March 1997

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A

**Keywords:** Government, Analysis, Estimating, Overhead/Indirect, Space Systems, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

**Title:** Strategic/Navigational/Weather/Crosslinks Payload Data Collection Update

**Summary:** This project will update the data base for various payloads, such as, strategic (DSP-like), navigational (GPS-like), weather (DMSP-like), and crosslinks. It will provide the data base to develop cost estimating relationships (CERs) and cost estimating crosschecks.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY97: \$200K  
Staff-years:

**Schedule:** Start: October 1996  
End: March 1997

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER

**Title:** New Technology Cost Study

**Summary:** This project will consider the cost impact of new technology. In the fast changing space environment, examination of emerging technology is necessary to maintain the utility of cost models. Some areas to be examined will include: MMIC, GaAs, NiH, and composites.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY98  
\$150K

Staff-years:

**Schedule:** Start: October 1997  
End: March 1998

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A., II.D

**Keywords:** Government, Estimating, Analysis, Advanced Technology, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

**Title:** Space-Environmental Cost Study

**Summary:** This project will study the cost impact of environmental concerns in space systems. It will focus primarily on costs associated with cleanup, containment, and handling of environmentally sensitive chemicals and hazardous materials.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY98  
\$250K  
Staff-years:

**Schedule:** Start: October 1997  
End: March 1998

**Data Base:** TBD

**Publications:** TBD

**Category:** I.C

**Keywords:** Government, Estimating, Analysis, Space Systems, Advanced Technology, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

**Title:** Wide Area Network (WAN) Data base

**Summary:** This project will examine the feasibility of CONUS wide sharing of a cost data base. With the consolidation and cross sharing of a cost data base to achieve cost synergy, availability and access will be examined through the use of a Wide Area Network. It will consider the cost, infrastructure, operations, and security of establishing a WAN data base among the space cost community.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY98  
\$100K

Staff-years:

**Schedule:** Start: October 1997

End: March 1998

**Data Base:** TBD

**Publications:** TBD

**Category:** I.D., II.D

**Keywords:** Government, Estimating, Analysis, Space Systems, Advanced Technology, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

**Title:** Common Bus CER Development

**Summary:** This project will develop the cost estimating relationship (CERs) for the common bus segment of space. It will collect data and develop CERs to estimate common bus costs. Given the emerging environment of common bus usage for multiple payloads, the development of a data base and CER is essential to future cost estimating capability.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY98  
\$150K  
Staff-years:

**Schedule:** Start: October 1997  
End: June 1998

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER, Mathematical Model, Computer Model

**Title:** Ground Segment WBS/CER Development

**Summary:** This project will standardize the WBS definition, identify cost drivers, and collect necessary data to update existing government data bases and test the relevancy of cost drivers. This effort will concentrate on existing useable government data bases. This effort is essential to provide the independent capability to estimate the ground segment of the total space architecture.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY99  
\$250K  
Staff-years:

**Schedule:** Start: October 1998  
End: June 1999

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression



**Title:** EHF Communication Payload Data base Update

**Summary:** This project will update EHF communication payload cost data for creating a data base for the development of cost estimating relationships (CER). The project will examine EHF payloads, such as Milstar, UFO, and other applicable programs.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY99  
\$150K  
Staff-years:

**Schedule:** Start: October 1998  
End: June 1999

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

**Title:** Launch Data base Update 99

**Summary:** This project will collect new cost data on the launch segment of space. It will add to the existing government cost data base (Launch Vehicle Cost Model, March 95). It will serve as a data base to update the cost estimating relationships. Collection will encompass all DoD and commercial launchers.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY99  
\$150K

Staff-years:

**Schedule:** Start: October 1998  
End: June 1999

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER

**Title:** Space Data base Update 2000

**Summary:** This project will update the consolidated space data base. It will encompass a wide range of data bases, i.e., bus, payloads, launchers, ground. It will be the main repository of all other data bases. This will also be crossfed to other space agencies, i.e., NASA, SMC.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY00  
\$250K  
Staff-years:

**Schedule:** Start: October 1999  
End: June 2000

**Data Base:** TBD

**Publications:** TBD

**Category:** IB., II.A., II.D

**Keywords:** Government, Estimating, Analysis, Space Systems, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

**Title:** Bus Data base Update 2000

**Summary:** This project will collect new cost data for bus or spacecrafts. It will cover any new datapoints or programs not covered in the previous effort. It will provide a data base to develop CERs.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY00  
\$150K  
Staff-years:

**Schedule:** Start: October 1999  
End: June 2000

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A., II.B

**Keywords:** Government, Estimating, Analysis, Space Systems, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

**Title:** Strategic/Navigational/Weather/Crosslinks Payload Data Collection

**Summary:** This project will collect new payload cost data on strategic (DSP-like), navigational (GPS-like), weather (DMSP-like), and crosslinks. It will update the data base to develop cost estimating relationships (CERs) and cost estimating crosschecks.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY00  
\$200K  
Staff-years:

**Schedule:** Start: October 1999  
End: June 2000

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

**Title:** Multinational Satellite Cost Study

**Summary:** This project will examine the cost estimating issues in developing and manufacturing multinational satellites. It will cover the efficiencies and inefficiencies associated with multinational cooperation of satellite construction.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY01  
\$250K

Staff-years:

**Schedule:** Start: October 2000  
End: June 2001

**Data Base:** TBD

**Publications:** TBD

**Category:** I.A, II.B and II.D

**Keywords:** Government, Estimating, Analysis, Space Systems,  
Spares/Logistics, Life Cycle, Data Collection, Data Base,  
Mathematical Modeling, Statistics/Regression

**Title:** Bus CER Update and Development

**Summary:** This project will update the existing bus data base and cost estimating relationship (CER). This will bring the CER current with the latest existing technology and cost impacts.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY01  
\$150K  
Staff-years:

**Schedule:** Start: October 2000  
End: June 2001

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER

**Title:** Ground Segment Data base Update

**Summary:** This project will update the existing government cost data base which will be the basis of cost estimating relationship (CER) development. This will reflect the latest information available.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** TBD

**Resources:** Dollars: FY01  
\$150K  
Staff-years:

**Schedule:** Start: October 2000  
End: June 2001

**Data Base:** TBD

**Publications:** TBD

**Category:** I.B., II.A

**Keywords:** Government, Estimating, Analysis, Space Systems, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression



## **ARMY AVIATION AND TROOP COMMAND**

<b>Name</b>	U.S. Army Aviation and Troop Command, Systems and Cost Analysis Directorate	
<b>Address</b>	4300 Goodfellow Boulevard, St. Louis, MO 63120-1798	
<b>Director</b>	Mr. Allen W. Gillespie	(314) 263-1211
<b>Size</b>	Professional:	48
	Support:	7
<b>Focus</b>	Program Office Estimates Life-Cycle Cost Estimates (Development, Procurement Operating and Support Costs) Methodologies, Models, and Techniques Computer Applications, Data Base Development Special Studies, Boards, Task Forces Economic Analyses Validations	
<b>Activity</b>	Number of projects in progress:	25-30
	Average duration of a project:	3 weeks
	Average number of staff members assigned to a project:	2
	Average number of staff-years per project:	12
	Percent of effort conducted by consultants:	0%
	Percent of effort conducted by subcontractors:	0%

**Title:** Quick Turn-Around Operating and Support Costing Model

**Summary:** The Directorate for Systems and Cost Analysis is continually tasked to provide operating and support (O&S) costs for various helicopter systems and system mixes. Current models require substantial knowledge and familiarity beyond the necessary inputs. A model that provides a simplified interface with accepted standard models, proving rapid cost estimates for O&S, would be a valuable asset. [This task appeared in the 1994 catalog as ATCOM-1.]

**Classification:** Unclassified

**Sponsor:** Unsponsored

**Performer:** AMSAT-D-BD

G. Spolarich AMSAT-D-BD (314) 263-2758

K. Schenkin AMSAT-D-BD (314) 263-2821

S. Boevingloh AMSAT-D-BD (314) 263-2786

**Resources:** Dollars: In-house research project

Staff-years: 36 man-months or 5760 man-hours

**Schedule:** Start: August 1995

End: July 1996

**Data Base:** AMCOS

**Publications:** No major publications will be produced

**Category:** II.A

**Keywords:** Government, Estimating, Helicopters, Operations and Support, Computer Model, Study

**ARMY TANK AND AUTOMOTIVE COMMAND**

<b>Name</b>	Directorate of Cost & Systems Analysis (AMSTA-RM-V) Cost Analysis Division (AMSTA-RM-VC)																									
<b>Address</b>	U.S. Army Tank-Automotive and Armaments Command, Warren, MI 48397-5000																									
<b>Director</b>	Russell F. Feury	(810) 574-6665 (810) 574-8620 (Datafax)																								
<b>Size</b>	Professional:	37																								
<b>Focus</b>	Responsible for the preparation of Program Office Estimates (POEs), Life Cycle Cost Estimates (LCCEs), Economic Analyses (EAs), and Cost Research. The cost effort is prepared to support combat and combat support vehicles. Also provide Cost and Economic Analyses on operations and support.																									
<b>Activity</b>	Number of projects in progress: <table border="0" style="margin-left: 40px;"> <tr> <td>Program Office Estimate</td> <td>5*</td> </tr> <tr> <td>Life Cycle Cost Estimates</td> <td>5</td> </tr> <tr> <td>Economic Analyses</td> <td>6</td> </tr> <tr> <td>Cost Research</td> <td>2</td> </tr> </table> Average duration of a project: <table border="0" style="margin-left: 40px;"> <tr> <td>Program Office Estimate</td> <td>10-15 weeks</td> </tr> <tr> <td>Life Cycle Cost Estimate</td> <td>4-6 weeks</td> </tr> <tr> <td>Economic Analysis</td> <td>3-5 weeks</td> </tr> <tr> <td>Cost Research</td> <td>14-17 weeks</td> </tr> </table> Average number of staff assigned to a project: <table border="0" style="margin-left: 40px;"> <tr> <td>Program Office Estimate</td> <td>4</td> </tr> <tr> <td>Life Cycle Cost Estimate</td> <td>2</td> </tr> <tr> <td>Economic Analysis</td> <td>1</td> </tr> <tr> <td>Cost Research</td> <td>2</td> </tr> </table>		Program Office Estimate	5*	Life Cycle Cost Estimates	5	Economic Analyses	6	Cost Research	2	Program Office Estimate	10-15 weeks	Life Cycle Cost Estimate	4-6 weeks	Economic Analysis	3-5 weeks	Cost Research	14-17 weeks	Program Office Estimate	4	Life Cycle Cost Estimate	2	Economic Analysis	1	Cost Research	2
Program Office Estimate	5*																									
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Economic Analysis	3-5 weeks																									
Cost Research	14-17 weeks																									
Program Office Estimate	4																									
Life Cycle Cost Estimate	2																									
Economic Analysis	1																									
Cost Research	2																									

\*Family of Medium Tactical Vehicles, Armored Gun System, Advanced Technology Program, Breacher, Hydraulic Excavator

**Title:** Virtual Prototyping on Army Land Systems (VPALS) Benefit Cost Study

**Summary:** The study has two primary objectives: First to identify and quantify the potential benefits of virtual prototyping to the Crusader Program and second to identify potential techniques for quantifying the impact of virtual prototyping on future estimates. To accomplish these objectives we are looking at current programs where virtual prototyping has been used and trying to work back to estimate the cost using traditional development methods. We are also working on a parallel effort focusing on testing that will provide us with information for this study.

**Classification:** Unclassified

**Sponsor:** U.S. Army Tank-Automotive and Armaments Command  
AMSTA-RM-VC

Richard Bazzzy (810) 574-8710

**Performer:** U.S. Army Tank -Automotive and Armaments Command  
AMSTA--RM-VC

Osman Gotham (810) 574-6537  
Margaret Stinson  
Deborah Moskwa

**Resources:** Dollars:  
Staff-years: FY 95: 1 Workyear

**Schedule:** Start: December 1994  
End: September 1995

**Data Base:** None

**Publications:** None

**Category:**

**Keywords:** Government, Estimating, Analysis, Land Vehicles, Test and Evaluation, Study

**Title:** Performance Affordability Assessment Model (PAAM)

**Summary:** The objective of this effort is to develop a cost model that will perform rapid costing of technology alternatives generated by the CASTFOREM wargame modeling process.

**Classification:** Unclassified

**Sponsor:** U.S. Army Tank-Automotive and Armaments Command  
AMSTA-RM-VC  
Richard Bazzy (810) 574-8710

**Performer:** U.S. Army Tank-Automotive and Armaments Command  
AMSTA--RM-VC  
Osman Gotham (810) 574-6537  
Diane Hohn  
Timothy Bensch

**Resources:** Dollars: \$125,000 (to date)  
Staff-years: FY 95: 2 Workyear

**Schedule:** Start: December 1994  
End: September 1995

**Data Base:** None

**Publications:** None

**Category:**

**Keywords:** Government, Estimating, Land Vehicles, Advanced Technology, Mathematical Modeling, Mathematical Model

**U.S. ARMY SPACE AND STRATEGIC DEFENSE COMMAND**



<b><i>Name</i></b>	Program Analysis and Integration Directorate U.S. Army Space and Strategic Defense Command
<b><i>Address</i></b>	P.O. Box 1500 Huntsville, Alabama 35807-3801
<b><i>Director</i></b>	Mrs. Carolyn S. Thompson (205) 955-3069
<b><i>Size</i></b>	Professional: 15 Support: 4 Consultants: 2 Support Contractors Contract Studies: 1
<b><i>Focus</i></b>	System life cycle cost estimating; development of cost estimating techniques and methodologies; cost research management for the command; develop operations research and special studies related to cost issues; command focal point for all issues related to cost estimates, and cost estimating methodologies
<b><i>Activity</i></b>	Number of projects in progress: 5 Average duration of a project: 1 year Average number of staff members assigned to a project: 1 Average number of staff-years per project: 1 Percent of effort conducted by consultants: 80% Percent of effort conducted by subcontractors: 10%

**Title:** Operations and Support (O&S) Cost Research, Data Collection and Factor/CER Development

**Summary:** This task is to collect cost and technical data, normalize the validated portions of the data and develop credible factors/cost estimating relationships (CERs) for use in estimating the cost of the O&S phase of Army weapon systems. All data collected and factors/CERs generated will be compiled in a comprehensive document for use by cost analysts.

**Classification:** Unclassified

**Sponsor:** USASSDC Program Analysis and Integration Directorate

Ms. Carolyn Thompson  
CSSD-PI  
P.O. Box 1500  
Huntsville, Alabama 35807-3801  
DSN 645-3069, (205) 955-3069

**Performer:** Tecolote Research, Inc.  
ATTN: Mr. Darryl Arnold  
4950 Corporate Drive, Suite #140-0  
Huntsville, AL 35905 (205) 895-0374  
  
Mr. Richard Thorn  
USASSDC Cost Analysis Division  
DSN 645-49222 (205) 895-0374

<b>Resources:</b>	Dollars	Staff-Years
FY 94	\$40,000	772 DPPH
FY 95	\$100,000	1710 DPPH

**Schedule:** Start: May 1994  
End: September 1995

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A.1

**Keywords:** Government, Estimating, Space Systems, Missiles,  
Spares/Logistics, Operations and Support, Data Collection,  
Mathematical Modeling, Data Base, CER

**Title:** Attitude Control Systems (ACS)/TMD Boosters

**Summary:** This task is to collect data, cost estimating relationships (CERs) and models, or construct specific applications of existing methodologies, to enhance cost estimating of theater missile defense systems, as directed.

**Classification:** Unclassified

**Sponsor:** USASSDC Program Analysis and Integration Directorate  
ATTN: Ms. Carolyn Thompson  
CSSD-PI  
P.O. Box 1500  
Huntsville, Alabama 35807-3801  
DSN 645-3069, (205) 955-3069

**Performer:** Tecolote Research, Inc.  
ATTN: Mr. Jeff McDowell  
4950 Corporate Drive, Suite #140-0  
Huntsville, AL 35905 (205) 895-0374  
Mr. Robert Barber  
USASSDC Program Integration Division  
DSN 645-5909 (205) 955-5909

**Resources:**

	Dollars	Staff-Years
FY 95	\$90,000	1381 DPPH

**Schedule:** Start: December 1994  
End: September 1995

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A.1

**Keywords:** Government, Weapon Systems, Missiles, Demonstration/Validation, EMD, Production, CPR/CCDR, Data Collection, Data Base, Propulsion

**Title:** Battle Management, Command, Control and Communications (BMC3) Cost Research, Data Collection and Factor/CER Development

**Summary:** This task is to collect cost and technical data, normalize the validated portions of the data, and develop credible factors/cost estimating relationships (CERs) for use in estimating the cost of the BMC3 systems. All data collected and factors/CERs generated will be compiled in a comprehensive document for use by cost analysts.

**Classification:** Unclassified

**Sponsor:** USASSDC Program Analysis and Integration Directorate  
ATTN: Ms. Carolyn Thompson  
CSSD-PI  
P.O. Box 1500  
Huntsville, Alabama 35807-3801  
DSN 645-3069, (205) 955-3069

**Performer:** Tecolote Research, Inc.  
ATTN: Mr. Greg Higdon; Mr. Tony Miller  
4950 Corporate Drive, Suite 140-0  
Huntsville, AL 35805  
(205) 895-0374  
  
Mr. Jeff Garrett, USASSDC Cost Analysis Division  
DSN 645-4492, (205) 955-4492

**Resources:** Dollars: FY95, \$60,000  
Staff-years: 909 DPPH

**Schedule:** Start: December 1994  
End: September 1995

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A.1

**Keywords:** Government, Estimating, Electronics/Avionics, EMD, Production, Data Collection, Mathematical Modeling, Data Base, CER

**Title:** Ground Based Radar (GBR) Cost Research

**Summary:** This task will build upon prior research efforts which developed a methodology to estimate Transmit/Receive Modules by adding new data points to allow for calibration, and to add confidence for current estimating problems.

**Classification:** Unclassified

**Sponsor:** USASSDC Program Analysis and Integration Directorate  
ATTN: Ms. Carolyn Thompson  
CSSD-PI  
P.O. Box 1500  
Huntsville, Alabama 35807-3801  
DSN 645-3069, (205) 955-3069

**Performer:** Tecolote Research, Inc.  
ATTN: Mr. Greg Higdon; Mr. Tony Miller  
4950 Corporate Drive, Suite 140-0  
Huntsville, AL 35805  
(205) 895-0374

Mr. Jack Calvert, USASSDC Cost Analysis Division  
DSN 645-3612, (205) 955-3612  
Mr. Rick Spencer, PEO MD, GBR Project Office  
DSN 645-5985, (205) 955-5985

**Resources:** Dollars: FY95, \$94,780  
Staff-years: 1723 DPPH

**Schedule:** Start: January 1995  
End: September 1995

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A.1

**Keywords:** Government, Estimating, Electronics/Avionics, Weapon Systems, Missiles, Demonstration/Validation, EMD, Production, CPR/CCDR, Data Collection, Data Base, CER, Cost Progress Curve

## **BALLISTIC MISSILE DEFENSE ORGANIZATION**

**Title:** Radar Hardware Cost Estimating Relationships (CER) Data Base

**Summary:** The Ballistic Missile Defense Organization (BMDO) requires cost estimating methods and CERs for radar hardware components, subassemblies, and subsystems to support ongoing life-cycle modeling of BMDO programs. A large number of CERs have been developed that apply to the BMDO effort. The requirement exists for a repository of all available radar hardware CERs that are available for application in BMDO life-cycle economic models. The objective of this task is to research and collect existing radar hardware CERs and catalog them into a database. Each CER is fully documented based on information in the source document and displayed in a standard format. A common radar WBS structure was developed and used to catalog each CER. Cost estimating relationships were collected at the radar subsystem, assembly, subassembly, and component levels. The database is further divided into conventional tube technology and solid state technology. A separate WBS and CERs are presented for each type of technology. The final report on the database is being reviewed.

**Classification:** Unclassified

**Sponsor:** BMDO

Mr. James Dryden (703) 412-1507

**Performer:** SAIC  
6725 Odyssey Drive  
Huntsville, Alabama 36806-3301

Mr. Fred Maksimowski (205) 971-6588

**Resources:** Dollars: N/A

Staff-years: .5

**Schedule:** Start: July 1994

End: May 1995



**Data Base:** Description: A resume sheet is prepared for each CER that describes the equation, input variables, list the source of the equation, identifies what is included and excluded in the CER, presents statistical fit data if available, discusses any limitations, lists the systems used to develop the CER and the year dollars of the results.

Automation: N/A

**Publications:** "Radar Hardware Cost Estimating Relationships (CER) Database," pending

**Category:** II.A.1

**Keywords:** Government, Estimating, Electronics/Avionics, Production, WBS, Data Collection, Survey, CER

**Title:** Missile Hardware Step Functions

**Summary:** There has been an increase number of questions regarding the step function used by the Ballistic Missile Defense Organization (BMDO) to model missile prototype hardware cost. Data from a number of missile systems were assembled and evaluated to determine the relationship between the "missile" level hardware costs for the theoretical first unit during each phase of a program acquisition cycle (Dem/Val EMD, LRIP and Production). The study revealed a step function for scaling from EMD to full scale production, but the data was not sufficient to produce scaling factors among other phases. A final report containing the data points used in the analysis, the normalization process and results of analysis is under review.

**Classification:** Unclassified

**Sponsor:** BMDO

Mr. James Dryden (703) 412-1507

**Performer:** SAIC  
6725 Odyssey Drive  
Huntsville, Alabama 36806-3301

Mr. Rick Taylor (205) 971-6423

**Resources:** Dollars: N/A

Staff-years: .6

**Schedule:** Start: September 1994

End: May 1995

**Data Base:** Description: Data for ~20 missile systems including: Missile-level hardware costs for each phase, quantity, contract description and number, and data source

Automation: Microsoft Excel

**Publications:** "Missile Hardware Step Functions," Rick Taylor, pending

**Category:** I.A.1

***Keywords:*** Government, Analysis, Missile, Demonstration/Validation, EMD, Production, Cost/Production Function, CPR/CCDR, Data Collection, Data Base, Study

**Title:** Missile Integration, Assembly, and Test (IA&T) Cost Methodology Improvement

**Summary:** The Ballistic Missile Defense Organization (BMDO) cost estimating methods require different levels of integration of missile components, subassemblies, and subsystems. Current convention uses a 7.4% integration factor at all levels. This factor cannot be supported at levels below the assembly level. The objective of this task is to research and collect data on missile integration cost at the subsystem, assembly, subassembly, and component levels and develop cost estimating relationships (CER) to estimate total and first unit integration cost for missile systems at the subsystem and assembly levels. Draft report is being reviewed.

**Classification:** Unclassified

**Sponsor:** BMDO  
Mr. James Dryden (703) 412-1507

**Performer:** SAIC  
6725 Odyssey Drive  
Huntsville, Alabama 36806  
Sharon Roberts (205) 971-6588

**Resources:** Dollars: N/A  
Staff-years: .5

**Schedule:** Start: November 1994  
End: May 1995

**Data Base:** Description: N/A  
Automation: N/A

**Publications:** "Missile Integration, Assembly, and Test (IA&T) Cost Methodology Improvement," Sharon Roberts, pending

**Category:** II.A.2

**Keywords:** Government, Estimating, Analysis, Missiles, Production, CPR/CCDR, Data Collection, Mathematical Modeling, Cost/Production Function, Statistics/Regression, CER, Study

**Title:** Endo-Atmospheric Missile Hardware Cost Estimating Relationships (CER) Database

**Summary:** The Ballistic Missile Defense Organization (BMDO) requires cost estimating methods and CERs for missile hardware components, subassemblies, and subsystems to support life-cycle modeling of BMDO programs. A large number of CERs have been developed that apply to the BMDO effort. The requirement exists for a repository of all available missile hardware CERs that are available for application in BMDO life-cycle economic models. The objective of this task is to research and collect existing missile hardware CERs and catalog them into a database. Each CER is fully documented based on information in the source document and put into a standard format. A common WBS structure was developed and used for cataloging each CER. Cost estimating relationships were collected at the radar subsystem, assembly, subassembly, and component levels.

**Classification:** Unclassified

**Sponsor:** BMDO  
Mr. James Dryden (703) 412-1507

**Performer:** SAIC  
6725 Odyssey Drive  
Huntsville, Alabama 36806  
Sharon Roberts (205) 971-6588

**Resources:** Dollars: N/A  
Staff-years: .5

**Schedule:** Start: May 1994  
End: December 1994

**Data Base:** Description: A resume sheet is prepared for each CER that describes the equation, input variables, list the source of the equation, identifies what is included and excluded in the CER, presents statistical fit data if available, discusses any limitations, lists the systems used to develop the CER and the year dollars of the results.

Automation: N/A

**Publications:** "Endo-Atmospheric Missile Hardware Cost Estimating Relationships (CER) Database," dated 30 December 1994.

**Category:** II.A.1

**Keywords:** Government, Estimating, Missiles, Propulsion, Airframe, Electronics/Avionics, Production, WBS, Data Collection, Survey, CER

**Title:** Unit Cost versus Production Rate

**Summary:** The purpose of this effort is to develop a data base and methodology for adjusting recurring production hardware cost for changes in production rates. Causes and effects are to be identified, data collected, and a methodology developed to provide for adjustments in production rate changes. Currently, a methodology does not exist to provide for this adjustment. It is anticipated that this methodology will be used for POM and/or budget updates. To date, a methodology and data base has been developed and a draft final report is in review.

**Classification:** Unclassified

**Sponsor:** BMDO  
Mr. James Dryden (703) 412-1507

**Performer:** SAIC  
6725 Odyssey Drive  
Huntsville, Alabama 36806  
Vicki B. Kitchens (205) 971-6517

**Resources:** Dollars: N/A  
Staff-years: .5

**Schedule:** Start: September 1994  
End: May 1995

**Data Base:** Description: Current data base exists as a Microsoft Excel spreadsheet containing recurring production costs, annual production rate, and maximum economic rate data entries for 10 missile systems.  
Automation: Microsoft Excel

**Publications:** "Unit Cost vs. Production Rate Analysis," Vicki Kitchens, pending

**Category:** I.A.2, II.A.2

**Keywords:** Government, Estimating, Analysis, Weapons Systems, Missiles, Production, Production Rate, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

**Title:** Cost Estimating Cross Check Guide

**Summary:** The purpose of this effort is to provide a methodology and database which cost analysts can use to perform cross-checks and credibility assessments of estimates they generate. Currently, there exists no formal methodology or consolidated database exist to accomplish these assessments. All cost cross-checks are currently done using the cost analyst's personal database and experience. It is anticipated that this methodology will be used to support all quick reaction cost estimates, with POM drills and budget updates experiencing the greatest benefit. To date, the methodology has been developed, a database has been generated, and the final report is being written.

**Classification:** Unclassified

**Sponsor:** BMDO  
Mr. James Dryden (703) 412-1507

**Performer:** SAIC  
6725 Odyssey Drive  
Huntsville, Alabama 36806-3301  
G. Todd Honeycutt (205) 971-6452

**Resources:** Dollars: N/A  
Staff-years: .8

**Schedule:** Start: September 1994  
End: May 1995

**Data Base:** Description: The current data base exists as Microsoft Excel spreadsheets containing cost, performance and design data for 38 missile systems, 49 satellites, and 46 radar systems. Bar charts graphically depict the relative cost of the various measures of cost outlined in the methodology.  
  
Automation: Microsoft Excel

**Publications:** "Cost Estimating Cross Check Guide," G. Todd Honeycutt, pending

**Category:** II.A.2



**Keywords:** Government, Analysis, Reviewing/Monitoring, Weapon Systems, Missiles, Space Systems, Electronics/Avionics, Demonstration/Validation, EMD, Production, Test and Evaluation, Data Collection, Data Base, Method

**NAVAL AIR SYSTEMS COMMAND**

<b>Name</b>	Naval Air Systems Command			
<b>Address</b>	Naval Air Systems Command Cost Department (AIR-4.2) 1421 Jefferson Davis Highway Arlington, VA 22243-5240			
<b>Director</b>	Noreen Bryan		(703) 604-3611 x2500	
<b>Size</b>	Professional:			
	NAVAIR HQs	84	NAWC-AD-LAKE	7
	NAWC-AD-IND	24	NAWC-WD-CL	15
	NAWC-AD-PAX/WAR	30	NAMO	13
<b>Focus</b>	<p>The Cost Department provides life cycle cost estimates, source selection cost evaluation, contractor performance measurement, cost analysis research, and cost/technical/programmatic databases for the purpose of providing a clear and comprehensive understanding of life cycle costs and attendant uncertainties to be used in developing, acquiring, and supporting affordable Naval Aviation systems.</p> <p>Primary focus of NAVAIR cost research is as follows:</p> <ol style="list-style-type: none"><li>1. Methods for estimating cost impacts of acquisition reform initiatives.</li><li>2. Improved methods and databases for estimating major aircraft modifications.</li><li>3. JAST-related: affordability initiatives and cost analysis/estimating technology upgrades.</li><li>4. Improved tools for conducting Integrated Baseline Reviews</li><li>5. Improved models for estimating ILS and O&amp;S costs</li><li>6. Improving efficiency in database operations and expanding multi-site capability.</li></ol>			
<b>Activity</b>	Number of projects in progress:		15	
	Average duration of a project:		2 years	
	Average number of staff members assigned to a project:		1-2	
	Average number of staff-years expended per project:		2	
	Percent of effort conducted by Staff:		25%	
	Percent of effort conducted by consultants:		75%	
	Percent of effort conducted by subcontractors:		0%	

**Title:** Acquisition Reform Strategy Study

**Summary:** Identify and test a general process for evaluating Acquisition Reform initiatives. Determine which functional areas and acquisition phases are impacted by the proposed initiative. Develop metrics for evaluating the proposed initiative. Apply the accepted process to other initiatives. Initiatives may include, but are not limited to Mil-Spec/Mil-Std non-compliance, Integrated Product Teams, and Lean Manufacturing.

**Classification:** Unclassified, but may include classified data

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Bill Stranges (703) 604-3611 X2563  
DSN: 664-3611 X2563

**Performer:** Management Consulting & Research, Inc.  
Falls Church, VA 22041

**Resources:** Dollars: FY95  
\$125K

Staff-years:

**Schedule:** Start: January 95  
End: September 95

**Data Base:** To be developed

**Publications:** Study Report

**Category:** II.D

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Missiles, EMD, Production, Manufacturing, Data Collection, Survey, Study, Method

**Title:** Naval Aviation Modification Model (NAMM) Data Base

**Summary:** With current military downsizing, the emphasis in acquisition has been in the area of modifications. The NAMM model will generate a "roughly right" modification cost estimate in a short turn around time. Cost, schedule, technical data collection, review, analysis, validation & verification started in Feb 94 and an automated data base and users guide exist. Future efforts will focus on adding additional data points, adding technical data, and further cross checking of existing data. (This task appeared in 1994 catalog as NAVAIR-5).

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Jan Young (703) 604-3440 X2601  
DSN: 664-3440 X2601

**Performer:** Management Consulting & Research, Inc.  
Falls Church, VA 22041

**Resources:** Dollars: FY94 FY95 FY96 FY97-98  
\$204K \$100K \$60K \$60K

Staff-years:

**Schedule:** Start:  
End:

**Data Base:** Access 2.0

**Publications:** Study Report, User's Guide

**Category:** II.C

**Keywords:** Government, Estimating, Aircraft, Modification, Production, Data Collection, Data Base, CER

**Title:** Overhead Study

**Summary:** Examine the growth of overhead and G&A rates for selected defense contractors. At the highest level possible, research what variables need to be tracked in order to determine the rough magnitude and direction that overhead and G&A rates will move in future years. Look for and identify factors that are different from business base fluctuation that cause overhead and G&A rates to change over time. Determine if and how these fluctuations can be predicted. (This task appeared in 1994 catalog as NAVAIR-11)

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Bill Geoghegan (703) 604-3611 x2513  
DSN: 664-3611 2513

**Performer:** Management Consulting & Research, Inc.  
Falls Church, VA 22041

**Resources:** Dollars: FY95  
\$75K

Staff-years:

**Schedule:** Start: May 1995  
End: September 1995

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.C

**Keywords:** Government, Analysis, Estimating, Overhead/Indirect, Data Collection, Method, Mathematical Model, Study

**Title:** Nonrecurring Design Hours for Avionics Equipment

**Summary:** Develop a method or technique for estimating nonrecurring design engineering hours associated with designing avionics equipment including aircraft radar systems, missile RF and IIR guidance sections, flights computers, navigation systems, etc. Collect historical cost data at the functional element level and by WBS. Also collect technical data related to the composition of the equipment being estimated (number & types of circuit card assemblies, surface mount vs. through hole, components per card, types of circuits, etc.) Identify cost drivers and productivity measures (number and types of drawings, number of reworked drawings, number of CAD stations, complexity of design in terms of design maturity, mil-spec versus commercial). The intent is to relate a productivity measure to design hours in such a way that the measure of productivity can be used as a surrogate to estimate design hours. (This task appeared in 1994 catalog as NAVAIR-7).

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Bill Stranges (703) 604-3611 x2563  
DSN: 664-3611 x2563

**Performer:** TBD

**Resources:** Dollars: FY95 FY96  
\$75K 150K

Staff-years:

**Schedule:** Start: May 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A.2

**Keywords:** Government, Estimating, Electronics/Avionics, EMD,  
Engineering, Labor, Data Collection, CER



**Title:** Aircraft ILS and O&S Cost Model

**Summary:** A model with a built in data base is needed to provide for estimating ILS/O&S costs where different aircraft or alternative configurations are required for comparison purposes. Effort will examine main cost drivers (e.g., reliability, maintainability, manning, and scheduled maintenance requirements). Effort will also include an investigation of the effects of new and emerging technologies, composites, and low observable materials. (This task was included in 1994 catalog as NAVAIR-6).

**Classification:** Unclassified, but may include proprietary data.

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-5240

Ron Anderson (703) 604-3440 X2620  
DSN: 664-3440 X2620

**Performer:** Brennan & Associates  
Arlington, TX 76016

**Resources:** Dollars: NTE  
750K

Staff-years:

**Schedule:** Start: May 1995  
End: September 1997

**Data Base:** To Be Developed

**Publications:** Study report, technical analysis.

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Aircraft, Spares/Logistics, Life Cycle, Operations and Support, Reliability, Sustainability, Advanced Technology, Data Collection, Survey, Study, Method, Computer Model

**Title:** Line Shutdown/Restart Costs

**Summary:** Identify work breakdown structure for production line shutdown, restart and production break setback costs. Incorporate terminal lot and post production planning considerations. Identify existing research methodology, studies, and data sources and acquire data. Future phases will concentrate on the development of a generic model for shutdown, restart, and production break costs by work breakdown structure element (This task was included in 1994 catalog as NAVAIR-2).

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
Ken Anderson (703) 604-3611 x2529  
DSN: 664-3611 x2529

**Performer:** Management Consulting & Research, Inc.  
Falls Church, VA 22041  
Mr. Bernard Fox (703) 820-4616

**Resources:** Dollars: 

<u>FY94</u>	<u>FY95</u>
\$80K	\$100K

  
Staff-years:

**Schedule:** Start:  
End:

**Data Base:** To be developed

**Publications:** Study Report

**Category:** II.C

**Keywords:** Government, Estimating, Aircraft, Production, Fixed Costs, Variable Costs, Data Collection, Computer Model

**Title:** Historical Data Book Data Base

**Summary:** With current military downsizing, the emphasis in acquisition has been in the area of modifications. The historical Data Book Data Base effort will review available in-house modification cost, technical, & programmatic data, briefly analyze and evaluate that data, compile data into databooks, and document the data so that an analyst will be able to understand and use the data in estimate development. Also planned is a process which will allow for systematic extraction, documentation, categorization, and compilation of data from proposals into databooks. (This task appeared in 1994 catalog as NAVAIR-5).

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Jan Young (703) 604-3440 X2601  
DSN: 664-3440 X2601

**Performer:** Management Consulting & Research, Inc.  
Falls Church, VA 22041

**Resources:** Dollars: FY95 FY96 FY97 FY98  
\$100K \$100K \$100K \$100K

Staff-years:

**Schedule:** Start: June 1995  
End: September 1998

**Data Base:** To be developed

**Publications:** Data Books

**Category:** II.C

**Keywords:** Government, Estimating, Aircraft, Modification, Production, Data Collection, Data Base, CER

**Title:** Missile System Engineering/Program Management for EMD and Production

**Summary:** Collect data on a variety of missile and UAV systems. Examine tasks performed under SE/PM, normalize data, relate to known programmatics, and develop methods for estimating government and contractor SE/PM. (This task was included in 1994 catalog as NAVAIR-9)

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Bill Stranges (703) 604-3611 x2563  
DSN: 664-3611 x2563

**Performer:** Management Consulting & Research, Inc.  
Falls Church, VA 22041

**Resources:** Dollars: FY95 FY96  
\$150K \$150K

Staff-years:

**Schedule:** Start: May 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A.2

**Keywords:** Government, Industry, Estimating, Missiles, EMD, Production, Case Study, Data Collection, Method

**Title:** Cost Profiles for Weapon Systems

**Summary:** Develop historical cost profiles, by major WBS element, over time, in terms of constant dollars, escalated dollars, percent of total, and with significant programmatic milestones superimposed. The effort would involve acquiring and developing CCDR, CPR, and supplemental contractor data. Data acquisition would cross services. The product would include both graphic and tabular representations. These data will aid in profiling cost estimates, evaluating cost proposals, and updating estimates at completion. It should further facilitate the technical/cost assessment of the adequacy of the contractor's initial performance measurement baseline. (This task was included in 1994 catalog as NAVAIR-1).

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Melissa Boord (703) 604-3611 X2451  
DSN: 664-3611 X2541

**Performer:** Management Consulting & Research, Inc.  
Falls Church, VA 22041

**Resources:** Dollars: FY94 FY95 FY96  
\$55K \$65K \$65K

Staff-years:

**Schedule:** Start: June 1994  
End: September 1996

**Data Base:** To be developed

**Publications:** Study Report and Data Base

**Category:** II.B

**Keywords:** Government, Industry, Analysis, Estimating, Aircraft, Missiles, Electronics/Avionics, EMD, Production, CPR/CCDR, Data Collection, Data Base, Method

**Title:** Update of Maurer Factor and Propulsion Data Base

**Summary:** The Maurer Factor CER does not include composite or metal/matrix materials. Such materials are being proposed by engine manufacturers for advanced engines. The new CER will be a viable tool in leveraging technology for affordability. Cost and technical data will be collected from engine manufacturers, manufacturing/materials technology centers, and Government facilities to modify existing CER or establish a new CER.

**Classification:** Unclassified, but may include classified data.

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Allan Pressman (703) 604-3440 X2663  
DSN: 664-3440 X2663

**Performer:** The Bionics Corporation  
Ketron Division  
Malvern, PA 19355-1370

**Resources:** Dollars: FY95 FY96  
\$75K \$75K

Staff-years:

**Schedule:** Start: April 1995  
End: March 1996

**Data Base:** To be developed

**Publications:** Study Report

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Aircraft, Propulsion, EMD, Production, Automation, Advanced Technology, Data Collection, Survey, Study, CER, Data Base

**Title:** New Support Technology Impacts on ILS

**Summary:** Prepare a study addressing impact of aircraft modernization and the probable impact on new Support Equipment (SE) acquisition costs. Develop defensible cost-estimating relationships (CER) that can be used to adjust costs from our current historical data bases for SE acquisition. Key areas that need to be addressed include: a) impact upon peculiar support equipment (PSE) requirements associated with maximizing BIT/BITE on aircraft, and b) impact upon PSE requirements associated with standardized CASS interfaces and changes in OTPS/TPS characteristics. (This was included in 1994 catalog as NAVAIR-8).

**Classification:** Unclassified

**Sponsor:** Naval Aviation Maintenance Office (NAMO-432B)  
Dale Johnson (301) 826-4594  
DSN: 326-4594

**Performer:** Cost Analysis and Estimating Section (John Mellin)  
Naval Air Warfare Center, Aircraft Division

**Resources:** Dollars: FY95  
\$75K  
Staff-years:

**Schedule:** Start: June 1995  
End: September 1995

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A.2

**Keywords:** Government, Estimating, Aircraft, Spares/Logistics, Data Collection, Study

**Title:** Hybrid Technology & CERs

**Summary:** Identify the key aspects of manufacturing a hybrid. Identify standard processing times and average material classifications and costs. Combine the process descriptions and standards into a complete package for the cost analyst for training and as a cost estimating reference. (This task appeared in 1994 catalog as NAVAIR-14)

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Indianapolis, IN

Carol Friederick (317) 353-3536  
DSN: 369-3536

**Performer:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Cost Analysis AIR-4.2.4 & Hybrid Technology Group

**Resources:** Dollars: FY96  
\$75K

Staff-years:

**Schedule:** Start: October 1995  
End: March 1996

**Data Base:** To be developed

**Publications:** Technology Reference Manual, User/Reference Manuals

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Electronics/Avionics, EMD, Production, Life Cycle, Material, Manufacturing, Data Collection, Survey, Study, CER, Computer Model



**Title:** Cable Technology & CERs

**Summary:** Identify the key aspects of manufacturing cables, including standard processing times and average material classifications and costs. (This task appeared in 1994 catalog as NAVAIR-15)

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Indianapolis, IN

Carol Friederick (317) 353-3536  
DSN: 369-3536

**Performer:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Cost Analysis AIR-4.2.4 & Cable Technology Group

**Resources:** Dollars: FY96  
\$75K

Staff-years:

**Schedule:** Start: October 1995  
End: March 1996

**Data Base:** To be developed

**Publications:** Technology Reference Manual, User/Reference Manuals

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Electronics/Avionics, EMD, Production, Material, Manufacturing, Data Collection, Survey, Study, CER, Computer Model

**Title:** Display and Control Panel Cost Data Base

**Summary:** Conduct research and data collection on different types of displays and control panels. Development of automated CERs is planned. Validation and model documentation are follow-on efforts. (This task appeared in 1994 catalog as NAVAIR-17)

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Indianapolis, IN

Carol Friederick (317) 353-3536  
DSN: 369-3536

**Performer:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Cost Analysis AIR-4.2.4

**Resources:** Dollars: FY96 FY97  
\$85K \$65K

Staff-years:

**Schedule:** Start: October 1995  
End: May 1997

**Data Base:** To be developed

**Publications:** Study Report, User/Reference Manuals

**Category:** II.C

**Keywords:** Government, Estimating, Analysis, Aircraft,  
Electronics/Avionics, Method, Data Collection, Survey, Study,  
CER, Computer Model

**Title:** Antenna Cost Data Base

**Summary:** Conduct research and data collection on different types of antennas. Development of automated CERs is planned. Validation and model documentation are follow-on efforts. (This task appeared in 1994 catalog as NAVAIR-16)

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Indianapolis, IN

Carol Friederick (317) 353-3536  
DSN: 369-3536

**Performer:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Cost Analysis AIR-4.2.4 & Hybrid Technology Group

**Resources:** Dollars: FY96 FY97  
\$65K \$85K

Staff-years:

**Schedule:** Start: October 1995  
End: May 1997

**Data Base:** To be developed

**Publications:** Study Report, User/Reference Manuals

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Aircraft, Electronics/Avionics, Method, Data Collection, Survey, Study, CER, Computer Model

**Title:** Cost Breakout

**Summary:** Analysis of today's defense contractors and programs to determine where the funds are allocated (e.g., how much of the design appropriation is targeted for design, system test, material, etc.) and how the allocation relates to the contractors' rate structure. The study results would serve as guidelines and cross references for budget preparation and proposal evaluation. (This task appeared in 1994 catalog as NAVAIR-19)

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Indianapolis, IN

Carol Friederick (317) 353-3536  
DSN: 369-3536

**Performer:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Cost Analysis AIR-4.2.4

**Resources:** Dollars:    FY96    FY97  
                     \$65K    \$85K

Staff-years:

**Schedule:** Start: October 1995  
End: May 1997

**Data Base:** To be developed

**Publications:** Study Report

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Budgeting, Data Collection,  
Study, Data Base

**Title:** Platform Integration and Installation Study & CERs

**Summary:** Collection of data on platform integration and installation costs and statements of work. Data collected would be used to develop a reference document for cost analysts and to create CERs for estimating the nonrecurring and recurring costs associated with the integration and installation of avionics into aircraft.

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Indianapolis, IN

Carol Friederick (317) 353-3536  
DSN: 369-3536

**Performer:** TBD

**Resources:** Dollars: FY96 FY97  
\$75K \$150K

Staff-years:

**Schedule:** Start: October 1995  
End: September 1997

**Data Base:** To be developed

**Publications:** Study Report

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Electronics/Avionics, EMD, Production, Integration, Data Collection, Study, CER, Computer Model

**Title:** CCDR Analysis Model

**Summary:** Develop software for rapid detailed analysis of CCDRs. Effort would include developing capability of receiving electronic submittals and, without further data entry, performing detailed calculations (currently done by hand) necessary to assess the validity of the report and compliance with contract requirements.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-5240

Bob Patterson (703) 604-3611 x2559  
DSN: 664-3611 x2559

**Performer:** Management Consulting & Research, Inc.  
Falls Church, VA 22041

Mr. Bernard Fox (703) 820-4616

**Resources:** Dollars: FY96  
\$90K

Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Computer Model

**Category:** II.A.2

**Keywords:** Government, Analysis, Estimating, CPR/CCDR, Data Collection, Data Base

**Title:** Environmental Impacts on Weapon System Costs

**Summary:** Initiate a data search to capture costs associated with environmental compliance. Identify methodology utilized by the EPA and various environmental engineering firms for the cost of complying with environmental requirements. Determine if existing programs could be utilized or modified for use by the Navy cost analysis community. Examine those programs or combination of programs to identify HAZMAT/cost relationships that have characteristics which would meet the needs of naval aviation. Establish a data base for the development of CERs. Based on the above results, establish the parameters of a model to capture life-cycle cost (LCC) associated with environmental compliance in naval aviation. (This task appeared in 1994 catalog as NAVAIR-3).

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center

John R. Spodofora (908) 323-7852  
DSN: 8-624-7852

**Performer:** Cost Analysis and Estimating Section  
Naval Air Warfare Center (908) 323-7852

**Resources:** Dollars: FY96  
\$100K

Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** Non-existent; to be developed

**Publications:** N/A

**Category:** II.C

**Keywords:** Government, Industry, Environment, Aircraft, Missiles, Life Cycle, Fixed Costs, Variable Costs, Data Collection, Data Base, CER, Method

**Title:** Make vs. Buy Decision Impacts on Airframe Production Programs

**Summary:** The purpose of this research task is to analyze the impacts of make vs. buy decisions on historical airframe production data and explore approaches to estimate these impacts in the future. The task will involve examining existing airframe production data to identify the magnitude of change in make-buy decision from year to year and from platform to platform. The task will also require researching technical and programmatic factors associated with all data. This effort will provide better insight into existing databases as well as adding higher fidelity to future databases.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-5240

Garry Newton (703) 604-3611 X2515  
DSN: 664-3611 X2515

**Performer:** Management Consulting & Research, Inc

Mr. Bernard Fox (703) 820-4600

**Resources:** Dollars:  
Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** N/A

**Publications:** Study report including raw cost & technical data.

**Category:** II.A

**Keywords:** Government, Estimating, Aircraft, Production, Material, Manufacturing, Acquisition Strategy, Data Collection, Study, Data Base



**Title:** Electronic Data Library

**Summary:** Utilizing existing computer technology, optimize the availability of credible cost data via a file server which can be accessed from each analysts' workstation. Cost data will be collected, input electronically and filed on a dedicated server for use by cost team members. A structured filing process and format will be developed and maintained. The Cost Competency will increase productivity by saving retrieval time and minimizing the duplication of effort.

**Classification:** Proprietary

**Sponsor:** Naval Air Warfare Center, Weapons Division (NAWCWPNS)  
China Lake, CA 93555-6001

Jim Knepshield (619) 939-3303  
DSN: 437-3303

**Performer:** Naval Air Warfare Center, Weapons Division (NAWCWPNS)  
China Lake, CA 93555-6001

Contractor Support Services - TBD

**Resources:** Dollars: FY96 2.25SY/\$283K  
FY97 2.25SY/\$270K  
FY98 2.25SY/\$280K  
FY99 2.25SY/\$280K

Staff-years:

**Schedule:** Start: October 1995  
End: September 1999

**Data Base:** Three primary software formats (Microsoft Word, Excel, Powerpoint)

**Publications:** Cost Data Library Input Process, Users Manual

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Aircraft, Missiles, Life Cycle, Data Collection, Study, Survey, Data Base

**Title:** Design to Cost Study

**Summary:** Because of the current DoD budget environment, there has been an increased emphasis on Design to Cost for Weapon Systems. This study would identify producibility parameters that could be measured and related to cost. The parameters would also be related to learning curves and learning curve analysis.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-5240

Joe Incorvia (703) 604-3611 X2568  
DSN: 664-3611 X2568

**Performer:** Contractor Support Services - TBD

**Resources:** Dollars: FY96  
\$150K

Staff-years:

**Schedule:** Start: January 1996  
End: September 1996

**Data Base:** To be developed

**Publications:** Study Report

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Missiles, EMD, Production, Life Cycle, Data Collection, Study, Survey, Mathematical Model

**Title:** Competition Study

**Summary:** In 1990, a competition study was completed to determine cost/savings associated with dual sourcing. The study collected historical missile data, analyzed the data and developed a competition model to perform Competitive Alternative Sources Analysis (CASA). CASAs are required for defense of the Program Manager's Acquisition Strategy. FY96 effort will focus on collecting and updating systems included in the original study, collect and include AMRAAM production data, and production of a handbook on how to perform a CASA.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-5240

Joe Incorvia (703) 604-3611 X2568  
DSN: 664-3611 X2568

**Performer:** Contractor Support Services - TBD

**Resources:** Dollars: FY96  
\$150K

Staff-years:

**Schedule:** Start: January 1996  
End: September 1996

**Data Base:** To be developed

**Publications:** Study Report, CASA Handbook

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Missiles, EMD, Production, Data Collection, Study, Survey, Computer Model

**Title:** Rocket Motor Estimating Methods

**Summary:** Existing tactical missile rocket motor CERs predict significantly different costs for essentially the same set of physical or performance parameters. This project will identify the set of rocket motor CERs and categorize this data as to relative strengths and weaknesses of these estimating methods. Also will include identification of all relevant cost and non-cost parameters. Collect cost and associated technical data to postulate a set of the best rocket motor cost estimating methods.

**Classification:** Confidential, Proprietary

**Sponsor:** Naval Air Warfare Center, Weapons Division (NAWCWPNS)  
China Lake, CA 93555-6001

Jim Kneppshield (619) 939-3303  
DSN: 437-3303

**Performer:** Naval Air Warfare Center, Weapons Division (NAWCWPNS)  
China Lake, CA 93555-6001

Al Vokolek

**Resources:** Dollars: FY96  
1.2SY/\$175K

Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study Report

**Category:** II.C

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Missiles, EMD, Production, Life Cycle, Data Collection, Study, Survey, Data Base, CER

**Title:** Indirect O&S Cost Database

**Summary:** In order to be responsive to requests for O&S costs, we must better understand and address indirect O&S costs. This research will define costs that are included in Naval Aviation, how the money is budgeted, how it is spent and tracked, where it is spent, and what was delivered. The effort will focus on finding the best way to break down these costs to the lowest practical level.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-5240

Ray Borkowski (703) 604-3440 X2616  
DSN: 664-3440 X2616

**Performer:** TBD

**Resources:** Dollars: FY95 1.5SY/\$50K  
FY96 1.5SY/\$50K  
Staff-years:

**Schedule:** Start: October 1995  
End: September 1997

**Data Base:** VAMOS/HONA integration is desired

**Publications:** Study report, data base, cost structure

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Aircraft, Missiles, Operations & Support, Overhead/Indirect, Data Collection, Survey, Study, Data Base

**Title:** Test Program Set (TPS) CERs

**Summary:** A need exists for CERs for estimating non-recurring and recurring TPS and OTPS costs at the Weapons Replaceable Assembly (WRA) and Shop Replaceable Assembly (SRA) levels during the early phases of an aircraft weapon system's acquisition cycle. Collection of TPS cost data is started; a TPS/OPS unique Work Breakdown Structure (WBS) is developed, and CCDRs conforming to this WBS are routinely submitted from several contractors. This effort will concentrate on continued data collection (cost and technical) and development of a database. Quantitative analysis of collected data to produce usable CERs. Existing models and techniques will also be identified, evaluated, and enhanced/modified to incorporate the study results.

**Classification:** Unclassified

**Sponsor:** Naval Air Maintenance Office (NAMO)  
Patuxent River, MD 20670

Richard Kohn/Ed Smith (301) 826-3838 X162  
DSN: 326-3238 X162

**Performer:** Contractor Support Services - TBD

**Resources:** Dollars: FY96  
\$75K

Staff-years:

**Schedule:** Start: October 1995  
End: September 1997

**Data Base:** Microsoft Office software applications

**Publications:** Study report, data base, cost structure

**Category:** II.C

**Keywords:** Government, Estimating, Analysis, Operations and Support, EMD, Life Cycle, Spare/Logistics, Reliability, Sustainability, Data Collection, Survey, Study, Data Base, Computer Model

**Title:** Mission Personnel Factors for Missiles

**Summary:** Develop supportable mission personnel factors. The effort will entail collecting aviation ordnancemen (AOs) support man-hours data associated with retrieving, handling, inspecting, up/downloading, and returning of missile systems and normalizing the data across selected weapon systems.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
Tony Boone (703) 604-3440 x2617  
DSN: 664-3440 x2617

**Performer:** Management Consulting & Research, Inc.

**Resources:** Dollars: FY96  
\$75K  
Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A

**Keywords:** Government, Analysis, Estimating, Missiles, Manpower/Personnel, Data Collection, Method, Mathematical Model

**Title:** Learning Curves and Rates By Commodity and Contractor

**Summary:** The scope of the effort is to collect learning curve/rate studies residing throughout the cost community and categorize studies by completeness, basis of cost (actuals, estimates, proposals, etc.), commodity, life-cycle phase, contractor/supplies, and acquisition environment (sole source, competition, etc.). Ultimately, a model/data base of studies complete with a user manual is planned for distribution throughout the cost community.

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center (NAWC AD IND)  
Carol Friedrick (317) 353-3536  
DSN: 369-3536

**Performer:** Same as above

**Resources:** Dollars: FY96  
\$75K  
Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A

**Keywords:** Government, Analysis, Estimating, Data Collection, Method, Computer Model, Study, Data Base, Cost Progress Curve



**Title:** Warranty Cost-Estimating Tools

**Summary:** Collection of the impact of warranties on contract cost. The research will focus on the cost of the warranty in the original contract as well as the savings in maintenance cost due to the warranty. A method to determine the cost of the warranty and potential savings based on the historical collection is the goal.

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center (NAWC AD IND)  
Carol Friedrick (317) 353-3536  
DSN: 369-3536

**Performer:** Same as above

**Resources:** Dollars: FY96  
\$75K  
Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A.2

**Keywords:** Government, Analysis, Method, Estimating, Acquisition Strategy, Data Collection, Data Base

**Title:** OPEVAL and TECHEVAL Cost-Estimating Tools/CERs

**Summary:** Collection of data on Technical Evaluation and Operational Evaluation costs and development of CERs are planned. This effort includes automation and documentation of CERs.

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center (NAWC AD IND)  
Carol Friedrick (317) 353-3536  
DSN: 369-3536

**Performer:** Same as above

**Resources:** Dollars: FY96  
\$75K  
Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A

**Keywords:** Government, Analysis, Estimating, Data Collection, Method, Computer Model, Test and Evaluation, Data Base, CER

**Title:** Test Program Sets (TPS) and Test Requirement Documentation (TRD) Cost

**Summary:** Research and collection of data on test program sets and test requirement documentation costs for the development and automation of CERs.

**Classification:** Unclassified

**Sponsor:** Naval Air Warfare Center (NAWC AD IND)  
Carol Friedrick (317) 353-3536  
DSN: 369-3536

**Performer:** TBD

**Resources:** Dollars: FY96  
\$75K  
Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A

**Keywords:** Government, Analysis, Estimating, Test and Evaluation, Electronics/Avionics, Data Collection, Data Base

**Title:** Missile Test and Evaluation Data Including Aircraft Integration Costs

**Summary:** Collect data, by field activity, on tasks and costs associated with testing and integrating air-to-air and air-to-ground missiles. Data would distinguish between contracts and government test.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
Bill Stranges (703) 604-3611 x2563  
DSN: 664-3611 x2563

**Performer:** TBD

**Resources:** Dollars: FY96  
\$100K  
Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A

**Keywords:** Government, Estimating, Missiles, Test and Evaluation, Data Collection, Data Base, CER

**Title:** F/A-18 Logistics Cost Data Base

**Summary:** Develop a detailed data base starting with the historical STARS HAPCA Integrated Logistics Support and Spares data sets. Track actual purchases at the lowest level possible using data from a variety of sources, including contracts awarded, APML and PMA obligation records and budget backups, and related documents to build a complete record of actual purchases for support equipment, automated test equipment, test program sets, training devices, technical manuals and other support requirements. Concurrent with the cost breakout for each ILS element, prepare a "history" describing what was purchased and delivery dates by logistics element (e.g., levels of maintenance and sites supported, quantities and types of simulators purchased, field activities supporting the T/M/S, contents of "other ILS" requirements, special sparing requirements and pickup kits, and logistics problems and compromises that completely document the program).

**Classification:** Unclassified

**Sponsor:** Naval Aviation Maintenance Office (NAMO-20)

Larry Stoll (301) 826-7900 x138  
DSN: 326-7900 x138

**Performer:** CSS

**Resources:** Dollars: FY96  
\$150K

Staff-years:

**Schedule:** Start: October 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A.1

**Keywords:** Government, Estimating, Aircraft, Spares/Logistics, Production, Data Collection, Data Base

**Title:** Affordability Initiatives (JAST Supported)

**Summary:** A number of affordability initiatives have been implemented/ proposed in an attempt to take strides to decrease system acquisition costs. In order to accurately adjust historically-based cost estimates for the new initiatives, the Cost Competency must be able to define and analyze the impacts of these initiatives (e.g., on programs like the F-22, V-22, and FA-18E/F). Products will include: a Cost Impact Matrix by WBS; a technical report; a cost initiatives database; and a recommended ranking of initiatives. This product will be used to adjust historically-based cost estimates/techniques to reflect the new acquisition initiatives.

**Classification:** Unclassified, but may include proprietary data.

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-5240

Dave Steffee (703) 604-3440 X2610  
DSN: 664-3440 X2610

**Performer:** The Analytical Sciences Corporation

**Resources:** Dollars: FY95 1.7SY/\$174K  
FY96 1.5SY/\$150K  
FY97 1.8SY/\$176K  
FY98-00 TBD

Staff-years:

**Schedule:** Start: April 1995  
End: September 1997

**Data Base:** To be developed

**Publications:** Study report including raw cost & technical data, a Cost Impact Matrix by WBS

**Category:** II.A, II.D

***Keywords:*** Government, Estimating, Analysis, Weapon Systems, Aircraft, EMD, Production, Operations and Support, Life Cycle, Acquisition Strategy, Material, Manufacturing, Data Collection, Survey, Study, Data Base

**Title:** Avionics Commodity Costs (JAST Supported)

**Summary:** A need exists for a useful estimating tool to provide supportable estimates in the early stages of program decision-making when detailed equipment definitions are not feasible. This effort will include collection of cost, technical, and programmatic information on newly-developed and fielded avionics equipment and normalization and analysis of data at the component and sub-component levels.

**Classification:** Unclassified, but may include proprietary data.

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-5240

Joe Cardarelli (703) 604-3440 X2625  
DSN: 664-3440 X2625

**Performer:** Naval Air Warfare Center, Aircraft Division (NAWCAD)

**Resources:** Dollars: FY95 1.7SY/\$174K  
FY96 1.5SY/\$150K  
FY97 1.8SY/\$176K  
FY98-00 TBD

Staff-years:

**Schedule:** Start: April 1995  
End: September 1997

**Data Base:** To be developed

**Publications:** Study report including raw cost and technical data and analysis

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Electronics/Avionics, EMD, Production, Life Cycle, Labor, Engineering, Manufacturing, Material, Data Collection, Survey, Study, Data Base



**Title:** Program Software Costs (JAST Supported)

**Summary:** An accurate methodology to estimate software costs that is based on historical data from actual, analogous programs is needed to replace models based on lines of code (LOC). This effort will include the collection of cost, technical, and programmatic information on analogous software programs and normalization and analysis of data to reveal LOC values and corresponding costs. Products will facilitate identification of a methodology that will enable generation of more accurate software cost estimates.

**Classification:** Unclassified, but may include proprietary data.

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-5240

Joe Cardarelli (703) 604-3440 X2625  
DSN: 664-3440 X2625

**Performer:** Naval Air Warfare Center, Aircraft Division (NAWCAD)

**Resources:** Dollars: FY95 0.6SY/\$80K  
FY96 1.1SY/\$160K  
FY97 1.2SY/\$170K  
FY98-00 TBD

Staff-years:

**Schedule:** Start: April 1995  
End: September 1997

**Data Base:** To be developed

**Publications:** Study report including raw cost & technical data and analysis

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Electronics/Avionics, EMD, Production, Life Cycle, Data Collection, Survey, Study, Method

**Title:** Operating and Support (O&S) Study (JAST Supported)

**Summary:** The Joint Cost Oriented Resource Estimating (JCORE) model will provide a joint Air Force/Navy capability to evaluate aircraft squadron-level operating and support costs. This model will be developed during FY95 and will interface with the Joint Operating and Support Cost Technology Evaluation (JOSTE) Model which was developed during FY94. The JOSTE model analyzes technology at the system, subsystem, and component levels.

**Classification:** Unclassified, but may include proprietary data.

**Sponsor:** ASC/ALTB  
Wright-Patterson AFB, OH 45433-7642

Fred Conway (513) 255-8572  
DSN: 785-8572

Ron Anderson (703) 604-3440 X2620  
DSN: 664-3440 X2620

**Performer:** RJO  
Fairborn, OH 45324

**Resources:** Dollars: FY95 1.3SY/\$130K  
FY96 3.4SY/\$340K  
Staff-years:

**Schedule:** Start: May 1995  
End: September 1996

**Data Base:** To be developed

**Publications:** Study report, technical analysis.

**Category:** II.A.2

**Keywords:** Government, Estimating, Analysis, Spares/Logistics, Operations and Support, Data Collection, Survey, Study, Data Base, Computer Model

**Title:** Avionics ILS/O&S Cost Model (JAST Supported)

**Summary:** A model is needed to estimate Avionics ILS and O&S costs to a standard element structure to support COEAs and various cost drills. This effort will include determination of cost drivers and methods, as well as the effects of new and emerging technologies on avionics ILS and O&S costs. Review and assessment of existing models and comparative analysis to develop a new model will be performed.

**Classification:** Unclassified, but may include proprietary data.

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Ray Borkowski (703) 604-3440 X2616  
DSN: 664-3440 X2616

**Performer:** Naval Air Warfare Center, Aircraft Division (NAWCAD)  
Indianapolis, IN 41219-2188

**Resources:** Dollars: FY95 0.5SY/\$75K  
FY96 1.0SY/\$150K  
FY97 1.0SY/\$150K  
FY98-00 TBD

Staff-years:

**Schedule:** Start: April 1995  
End: September 1997

**Data Base:** To be developed

**Publications:** Study report and analyses

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Electronics/Avionics, Life Cycle, Spares/Logistics, Operations and Support, Advanced Technology, Automation, Data Collection, Survey, Study, Mathematical Model

**Title:** Update Propulsion Cost Estimating Relationships (JAST Supported)

**Summary:** The current propulsion CERs do not include advanced material composition and processing logic which engine manufacturers are proposing to use as cost reduction and performance enhancing factors. This information will help us to be able to analyze engine manufacturer's affordability proposals in a more proficient manner. Data shall be collected from engine manufacturers, Manufacturing/Materials Technology Centers, airframe manufacturers, and Government facilities. Using the data collected we will either modify the current CERs or establish a new CER. A new CER must use input data that is readily available to the user. This CER will predict more accurately development and acquisition costs associated with current and advanced technology engines. The results of this study will be non-proprietary and available for use by Government agencies and DoD contractors.

**Classification:** Unclassified, but may include proprietary data.

**Sponsor:** Nava' Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Allan Pressman (703) 604-3440 X2663  
DSN: 664-3440 X2663

**Performer:** Bionics, Ketron Division  
Malvern, PA 19355-1370

**Resources:** Dollars: FY96 1.6SY/\$164K  
FY97-00 TBD

Staff-years:

**Schedule:** Start: January 1996  
End: December 1996

**Data Base:** To be developed

**Publications:** Study Report

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Aircraft, Propulsion, EMD,  
Production, Automation, Advanced Technology, Data  
Collection, Survey, Study, CER, Data Base

**Title:** Update Propulsion O&S Model (JAST Supported)

**Summary:** The current propulsion O&S model does not have the capability to distinguish between modular and non-modular engines. Engine manufacturers are proposing to use more modularity in their engines as a cost reduction factor. The revised model will be a viable tool in analyzing the engine manufacturer's LCC proposals in a more proficient manner. This model will be developed by adapting portions of the existing model, and modified with the expanded module database. The contractor shall collect cost and technical data to update the current propulsion O&S database. Data shall be collected from engine manufacturers and Government facilities for the F100, F101, F110, F404, and T700 engines.

**Classification:** Unclassified, but may include proprietary data.

**Sponsor:** Naval Air Systems Command  
1421 Jefferson Davis Hwy  
Arlington, VA 22243-1000

Allan Pressman (703) 604-3440 X2663  
DSN: 664-3440 X2663

**Performer:** Bionics, Ketron Division  
Malvern, PA 19355-1370

**Resources:** Dollars: FY96 1.2SY/\$120K  
FY97-00 TBD

Staff-years:

**Schedule:** Start: January 1996  
End: December 1996

**Data Base:** To be developed

**Publications:** Study Report

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Aircraft, Propulsion, Life Cycle, Automation, Advanced Technology, Data Collection, Survey, Study, Mathematical Model, Data Base

**NAVAL SEA SYSTEMS COMMAND**

<b><i>Name</i></b>	Cost Estimating and Analysis Division, Comptroller Directorate, Naval Sea Systems Command		
<b><i>Address</i></b>	2531 National Center Bldg. 3 Arlington, VA 22242-5160		
<b><i>Director</i></b>	Michael C. Hammes	(703) 602-1209	
	Deputy Director: Irvin M. Chewning	(703) 602-0720	
<b><i>Size</i></b>	Professional:	57	
	Support:	6	
	Consultants:	0	
	Subcontracts:	11	
<b><i>Focus</i></b>	<p>NAVSEA cost research focuses principally in the following areas:</p> <ol style="list-style-type: none"> <li>1. Commonality and standardization of ship design and construction processes and of Ship Components or Sub-assemblies (Impact on acquisition and O&amp;S costs)</li> <li>2. Build Strategy Impact on Ship Costs</li> <li>3. Ship Design Trade-Off Analysis Tools</li> <li>4. Impacts on Ship Costs of Environmental Requirements</li> <li>5. Weapon System Cost Modeling</li> </ol>		
<b><i>Activity</i></b>	Number of projects in progress:	12	
	Average duration of a project:	2 years	
	Average number of staff members assigned to a project:	1	
	Average number of staff-years per project:	2	
	Percent of effort conducted by consultants	0%	
	Percent of effort conducted by subcontractors	85%	



**Title:** Product-Oriented Design and Construction (PODAC) Cost Data Collection and Analysis

**Summary:** Collect product-oriented ship construction cost data and information on several ship classes, build strategy, and ship construction impact resulting from implementation of Affordability Through Commonality (ATC) modules. Analyze behavioral characteristics for Engineering/Integration and Ship Assembly Services. [This task appeared in the 1994 catalog as NAVSEA-1.]

**Classification:** Business Sensitive

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)  
Jerome Acks (703) 602-1308 or  
DSN 8-332-1308

**Performer** Avondale Shipbuilding, Inc.  
Ingalls Shipbuilding, Inc.  
Bath Iron Work, Inc.  
Newport News Shipbuilding  
National Steel and Shipbuilding Company  
  
Robert Jones  
Carderock Division, Naval Surface Warfare Center (211)  
Bethesda, MD 20084-5000 (301) 227-4102  
DSN 8-287-4012

<b>Resources:</b>	<u>FY94</u>	<u>FY95</u>	<u>FY96</u>	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>
	\$297K	\$250K	TBD	TBD	TBD	TBD

**Schedule:** TBD

**Data Base:** Return cost data for LSD 44-48, LHD 2, DDG 51, CVN and AOE 6

**Publications:** Affordability Through Commonality (ATC) Study by Avondale Industries (Phase I); Affordability Through Commonality (ATC) Study by Avondale Industries (Phase II); Affordability Through Commonality (ATC) Study by Ingalls Shipbuilding; Summary of Shipyard #1 Data: Work Distributions by Trade, ATC Modules Cost Impacts, Cost Estimating Methodologies

**Category:** II.C

***Keywords:*** Industry, Government, Analysis, Estimating, Ships, Production, Labor, Materials, Overhead/Indirect, Engineering, Manufacturing, WBS, Data Collection, Date Base

**Title:** Near-Term Prototype PODAC Cost Model

**Summary:** Study to investigate two different approaches to building a prototype Product-Oriented Design and Construction (PODAC) Cost Model. One approach is to emulate the production process and to describe the ship's design in ways that can be directly linked to the processes. The second approach is to describe the ship as an assembly of modules, and the details (including costs) of each module are known and contained in the model's data base. [This task appeared in the 1994 catalog as NAVSEA-2.]

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)

Jerome Acks (703) 602-1308  
DSN 8-332-1308

**Performer:** Howard Bunch University of Michigan  
Department of Naval Architecture and  
Marine Engineering  
Ann Arbor, Michigan 48109

(313) 764-6503

**Resources:** FY94 FY95  
\$153K TBD

**Schedule:** Start: May 1994

End: May 1995

**Data Base:** None

**Publications:** Product Oriented Design and Construction Cost Model  
Development, Phase I; Product Oriented Design and Construction  
Cost Model Development, Phase II

**Category:** II.D

**Keywords:** Government, Estimating, Ships, Production, Engineering,  
Manufacturing, Survey, Mathematical Modeling, Computer Model,  
Study

**Title:** Shipbuilding Process Simulation Model

**Summary:** This project is intended to develop a systems dynamics model of the shipbuilding process that can be used to quantify the cost and schedule impacts of ship construction delays, construction process reconfiguration, alternative build strategies, and design trade-off studies. The effort is aimed at producing a model sensitive to the myriad of cause-and-effect relationships and the complex web of feedback linkages inherent in the ship production process.

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)

Jerome Acks  
703-602-1308  
DSN 8-332-1308

**Performer:** Decision Dynamics, Inc.  
8601 Georgia Ave., Suite 806  
Silver Springs, MD 20910  
Dr. L. Alfeld (301) 565-4040

<b>Resources:</b>	<u>FY94</u>	<u>FY95</u>
	\$25K	\$510K

**Schedule:** Start: December 1994  
End: December 1996

**Data Base:** None

***Publications:*** Technical Study Report; Computer Program Documentation

**Category:** II.B

**Keywords:** Government, Industry, Analysis, Estimating, Ships, Labor, Material, Overhead/Indirect, Engineering, Manufacturing, WBS, Mathematical Model, Cost/Production Function, Computer Model

**Title:** Costing Tools in Support of Parametric CAD Tools

**Summary:** Develop costing tools that interface with CAD tools for designing shipboard distributive systems. These cost-estimating procedures will allow system engineers to quickly assess the relative cost of alternative system approaches as the designs are being developed at CAD work stations. Initial efforts are aimed at developing a cost estimating methodology that can be universally applied to distributive system zonal architecture; specifically investigating zonal fire main and HVAC systems. Also conducting a study of the interface needed to connect cost estimating tools and CAD tools. [This task appeared in the 1994 catalog as NAVSEA-4.]

**Classification:** Business Sensitive

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)

Jerome Acks                      703-602-1308 or  
DSN 8-332-1308

**Performer:** Carderock Division  
Naval Surface Warfare Center (211)  
Bethesda, MD 20084-5000

Robert Jones                      301-227-4102  
DSN 8-287-4012

**Resources:** FY94   FY95   FY96   FY97   FY98   FY99  
\$0K      \$150K   \$150K   \$200K   \$200K   TBD

**Schedule:** TBD

**Data Base:** Cost data on a zonal distributed fire main system

**Publications:** Prototype cost model and documentation for distributive systems report (FY95); Distributive System Zonal Architecture Study Report (FY95); Cost Estimating and CAD Interface Study Report (FY95)

**Category:** II.B

**Keywords:** Industry, Estimating, Analysis, Ships, Production, Labor, Materials, Overhead/Indirect, Engineering, Case Study, CER, Study

**Title:** Hull, Mechanical, and Electrical (HM&E) Navy Infrastructure Cost Analysis

**Summary:** Examine the infrastructure costs of selected elements of the Naval Shore Establishment incurred to operate and support HM&E equipment on board Navy ships. Initial efforts will investigate potential savings relative to various levels of component commonality on the infrastructure costs of training, intermediate maintenance, and depot maintenance. [This task appeared in the 1994 catalog as NAVSEA-5.]

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)  
Jerome Acks (703) 602-1308 or  
DSN 8-332-1308

**Performer:** Naval Center For Cost Analysis  
Information Spectrum, Inc. (703) 746-2312

**Resources:** FY94 FY95  
\$0K TBD

**Schedule:** TBD

**Data Base:** None

**Publications:** Study Report

**Category:** II.D

**Keywords:** Government, Analysis, Ships, Operations and Support, Data Collection, Mathematical Modeling, Study

**Title:** ATC Operating and Support Cost Model

**Summary:** Develop an Operating and Support/Life Cycle Cost Modeling that will be sensitive to the use of common modules across classes, and increased equipment commonality. The model(s) will be used to assess the cost impacts of time-phased introduction of ATC modules and other ATC initiatives on a fleet-wide basis. Initial effort was to develop an optimization model, based on acquisition cost, for a selecting a "family" of modules used on a fleet-wide basis. Additional efforts will be to incorporate research and development, and operating and support costs into the optimization model. [This task appeared in the 1994 catalog as NAVSEA-6.]

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)  
Jerome Acks (703) 602-1308  
DSN 8-332-1308

**Performer:** Naval Surface Warfare Center  
Carderock Division  
Bethesda, Maryland 20084-5000  
Robert Jones (301) 227-4102  
DSN 287-4012

**Resources:** FY94 FY95 FY96 FY97 FY98 FY99  
\$75K \$250K \$445K \$300K TBD TBD

**Schedule:** Start: March 1994  
End: September 1996

**Data Base:** None

- Publications:**
1. "An Optimization Approach to the Cost Assessment of Affordability Through Commonality Systems," Milano, Anjali K., Smith, Timothy C., and Jeffers, Michael F., Jr., 1994.
  2. Report on Optimization Model and documentation (FY95) ATC Module Optimization Study Report (FY95)
  3. LCC Requirements Study Report (FY95)

**Category:** II.A.2, II.D

***Keywords:*** Government, Analysis, Ships, Operations and Support, Data Collection, Mathematical Modeling, Study



**Title:** Commercial Specs versus Military Specs

**Summary:** Investigate and quantify the cost difference between the use of commercial and military specifications in ship construction using experience from U.S. and European shipyards. [This task appeared in the 1994 catalog as NAVSEA-7.]

**Classification:** Business Sensitive

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)  
Jerome Acks (703) 602-1308  
DSN 8-332-1308

**Performer:** DAI, Inc.  
Three Crystal Park, Rm 111  
2231 Crystal Drive  
Arlington, VA 22202  
Don Walter (703) 920-9200

**Resources:** FY94 FY95  
\$130K \$50K

**Schedule:** Start: November 1993  
End: September 1995

**Data Base:** None

**Publications:** Study results documentation

**Category:** II.C

**Keywords:** Industry, Government, Estimating, Analysis, Ships, Production, Labor, Materials, Overhead/Indirect, Engineering, Manufacturing, WBS, Case Study, Data Collection, Survey, Cost/Production Function, CER, Method, Mathematical Model, Study

**Title:** Estimating Methodology for Detail Design Costs

**Summary:** Develop detail design cost-estimating relationships (CERs) for lead and average follow ships. [This task appeared in the 1994 catalog as NAVSEA-8.]

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)

Jerome Acks (703) 602-1308  
DSN 8-332-1308

**Performer:** TBD

**Resources:** FY94 FY95 FY96  
\$0 \$0 \$50K

**Schedule:** Start: June 1995  
End: September 1995

**Data Base:** None

**Publications:** Study Report

**Category:** II.A.2

**Keywords:** Industry, Analysis, Ships, Production, Labor, Materials,  
Engineering, Data Collection, CER, Data Base

**Title:** Metrication of the U.S. Shipbuilding Industry

**Summary:** Investigate, discuss and quantify the cost impact of designing and constructing U.S. Navy ships in metric units of measurement. [This task appeared in the 1994 catalog as NAVSEA-9.]

**Classification:** Business Sensitive

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)

Jerome Acks (703) 602-1308  
DSN 8-332-1308

**Performer:** DAI, Inc.  
Three Crystal Park, Rm 111  
2231 Crystal Drive  
Arlington, VA 22202

Don Walter (703) 920-9200

**Resources:** FY94  
\$90K

**Schedule:** Completed: May 1995

**Data Base:** None

**Publications:** Study Report: "Metrication of the U.S. Shipbuilding Industry"

**Category:** II.C

**Keywords:** Industry, Government, Estimating, Analysis, Ships, Production, Operations and Support, Engineering, Data Collection, Survey, Study

**Title:** Cost Module for Sealift Ship Version of ASSET

**Summary:** The objective is to update the cost module of the ASSET ship design synthesis model and tailor it for use in assessing technology developments for sealift ships. This cost module was originally developed in the late 1970s for surface combatants. [This task appeared in the 1994 catalog as NAVSEA-10.]

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)  
Jerome Acks (703) 602-1308  
DSN 8-332-1308

**Performer:** Naval Surface Warfare Center  
Carderock Division  
Bethesda, Maryland 20084-5000  
Robert Jones (301) 227-4102  
DSN 287-4012

**Resources:** FY94 FY95 FY96  
\$30K \$190K \$60K

**Schedule:** Start: February 1994  
End: September 1996

**Data Base:** None

**Publications:** Study Reports

**Category:** II.A

**Keywords:** Government, Analysis, Ships, Concept Development, Labor, Material, Overhead/Indirect, Engineering, Acquisition Strategy, Data Collection, Mathematical Modeling, CER, Data Base, Method, Mathematical Model, Study

**Title:** Sealift Ship Operating and Support (O&S) Cost Data Collection and Analysis

**Summary:** Initiate O&S cost data collection within the Navy's Visibility and Management of Operating and Support Costs (VAMOSC) information system for sealift and related ships and develop O&S cost-estimating relationships. [This task appeared in the 1994 catalog as NAVSEA-11.]

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)

Jerome Acks                      703-602-1308  
DSN 8-332-1308

**Performer:** Naval Surface Warfare Center  
Carderock Division  
Bethesda, Maryland 20084-5000

Robert Jones                      (301) 227-4102  
DSN 287-4012

Naval Center for Cost Analysis

Al Doermann                      (703) 602-0278

**Resources:** FY94    FY95    FY96  
\$90K    \$50K    \$50K

**Schedule:** Start: February 1994  
End: September 1996

**Data Base:** None

**Publications:** Study Reports

**Category:** II.A.2

**Keywords:** Government, Estimating, Analysis, Ships, Operations and Support,  
Data Collection, CER, Data Base, Study

**Title:** Development of Product-Oriented Cost-Estimating Tools

**Summary:** The goal of this task is to assess whether existing cost-estimating relationships (CERs) for shipbuilding can be modified to reflect a product work breakdown structure based on a generic build strategy for Navy auxiliary ships or whether entirely new CERs must be developed. In the Navy's current cost-estimating approach for ships, CERs for shipbuilding costs are generally developed by shipboard subsystem. If the use of a product work breakdown structure in lieu of a system work breakdown structure requires new CERs, the task will develop the form, fit, and function of these new CERs and correlate them with existing methods. [This task appeared in the 1994 catalog as NAVSEA-12.]

**Classification:** Business Sensitive

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)

Jerome Acks  
703-602-1308  
DSN 8-332-1308

**Performer:** Naval Surface Warfare Center  
Carderock Division  
Bethesda, Maryland 2084-5000  
Various Shipyards

Robert Jones (301) 227-4102  
DSN 287-4012

## Various Shipyards

<b>Resources:</b>	<u>FY94</u>	<u>FY95</u>	<u>FY96</u>
	\$850K	\$150K	\$260K

**Schedule:** Start: November 1993

End: September 1996

**Data Base:** None to date

***Publications:*** None to date

**Category:** II.C, II.D

**Keywords:** Government, Estimating, Analysis, Ships, Production, Labor, Materials, Manufacturing, Cost/Production Function, CER, Data Base

**Title:** Private Shipbuilder Overhead Costs

**Summary:** The objectives of this study are to (1) provide a better understanding of private shipbuilder overhead costs; (2) measure the overhead cost changes, including changes from variable to fixed costs, caused by new construction techniques and the Sealift Technology Program initiatives; and (3) recommend improvements to the overhead forecasting model used by NAVSEA. [This task appeared in the 1994 catalog as NAVSEA-13.]

**Classification:** Unclassified

**Sponsor:** OSD(PA&E)  
Program Analysis and Evaluation  
Pentagon, Room 3E386  
Mr. Gary Bliss (703) 697-2999

**Performer:** IDA  
1801 North Beauregard Street  
Alexandria, VA 22311  
Bethesda, Maryland 20084-5000  
Dr. Stephen J. Balut (301) 227-4012

**Resources:** FY94 FY95 FY96  
\$170K \$340K \$240K

**Schedule:** Start: March 94  
End: August 1996

**Database** TBD

**Publications:** TBD

**Category:** II.A.2, II.D

**Keywords:** Industry, Estimating, Analysis, Ships, Production,  
Overhead/Indirect, Data Collection, Mathematical Modeling, Data  
Base



**Title:** Cost Analysis of Environmental Impacts

**Summary:** This task examined the current state of environmental impact cost analysis over the entire Naval systems life-cycle. The study commenced with a literature search to obtain a broad spectrum view of current cost modeling practices and their application to estimating the costs of environmental impacts. Little published information was available and subsequent more directed searches were performed, leading to on-going efforts within the Department of Defense cost analysis community. The report issued at the conclusion of the task provided a detailed body of information pertaining directly to the establishment of a cost analysis methodology. Existing programs are cited in the report and contact lists of key personnel are provided. The study concludes by providing specific technical and procedural recommendations which need to be considered for the development of a comprehensive methodology for performing environmental cost analysis. [This task appeared in the 1994 catalog as NAVSEA-14.]

**Classification:** Unclassified

**Sponsor:** Naval Sea Systems Command (SEA 0174)  
Sherman V. Hunger (703) 602-3012  
DSN 332-3012

**Performer:** Naval Surface Warfare Center  
Carderock Division  
Bethesda, MD 20084-5000  
Angela Milano (301) 227-5082  
DSN 287-5082

SDM Consulting, Inc.  
P.O. Box 359  
Upper Marlboro, MD 20773-0359  
S. Douglas Mauk

**Resources:** FY94  
\$49K

**Schedule:** Completed: September 1994

**Data Base:** None

***Publications:*** “Environmental Impact Cost Modeling for Navy Systems Life Cycle,” Anjali K. Milano, CD/NSWC 211, and S. Douglas Mauk, SDM Consulting, Inc., 1994.

***Category:*** I.C

***Keywords:*** Government, Estimating, Life Cycle, Environment, Survey, Study

**Title:** Analysis of Engineering, Integration, and Support Services Costs for Ship Construction

**Summary:** The project pertains to the engineering, integration and support service efforts involved in new ship construction. The study will improve understanding of the composition of the engineering, integration and support services costs for ship construction. The analysis will identify cost drivers, develop cost estimating relationships, and improve methodologies for estimating costs by compiling and documenting statistical models. [This task appeared in the 1994 catalog as NAVSEA-15.]

**Classification:** Business Sensitive

**Sponsor:** Naval Sea Systems Command (SEA-0171)

2531 Jefferson Davis Highway  
Arlington VA 22242-5160

Mr. Bob Meyer (703) 602-6570

**Performer:** Naval Sea Systems Command (SEA 01711)

Mr. Stephen J. Moretto (703) 602-1307

**Resources:** FY95

Staff-Years .25

**Schedule:** Start: October 1994

End: June 1995

**Data Base:** The data base which was compiled as a part of the project consists of over 300 Unit Price Analysis bid sheets and Cost Performance Reports. The data was entered into Lotus 2.3 for printouts and was electronically transferred to Statgraphics for Statistical Analysis. The data has been incorporated into a historical ship information database.

**Publications:** None

**Category:** II.A.1, II.A.2, II.B, II.C, II.D

**Keywords:** Government, Estimating, Analysis, Ships, Production, Labor, Material, Engineering, Integration, Statistics/Regression, Study, CER

**Title:** LPD-17 Class Cost Model Development

**Summary:** Program/modify existing SEA 017 Unit Price Analysis (UPA) cost model to produce a Basic Construction estimate in accordance with the Responsibility Assignment Matrix (RAM) format as provided by the LPD Design and Cost Team. Modify UPA model to reflect adjustments to the methodology by which Basic Construction cost and elements thereof are derived (i.e., estimating group 800 and 900, margin, etc.), including the utilization of both weight and non-weight driven CERs which could be based upon adjustments to various parameters (i.e., ship displacement, length, labor efficiencies, crew size, etc.). All program/modifications will be documented and provided to SEA 017 (Sponsor). [This task appeared in the 1994 catalog as NAVSEA-16.]

**Classification:** Unclassified

**Sponsor:** Naval Sea Systems Command (SEA 01731)  
William R. Crump III (703) 602-0013

**Performer:** User Technology Associates  
4301 N. Fairfax Drive, Suite 400  
Arlington, Virginia 22203  
(703) 552-5132

**Resources:** FY94  
\$9K

**Schedule:** Completed

**Data Base:** FoxPro Database

**Publications:** None

**Category:** II.A.1, II.A.2, II.B

**Keywords:** Government, Estimating, Analysis, Programming, Ships, Concept Development, Demonstration/Validation, Life Cycle, Labor, Material, Mathematical Modeling, Computer Model

**Title:** Surface Combatant Performance-Based Life Cycle Cost Model

**Summary:** The objective of the study is to develop a cost model sensitive to high-level performance parameters for predicting the Life Cycle Cost (LCC) of major surface combatants. The resulting model is envisioned as a tool to provide quick ROM cost estimates of surface combatant ship concepts during the Cost and Operational Effectiveness Analysis (COEA) process, or to investigate the cost implications of alternative mission requirements prior to Milestone II. [This task appeared in the 1994 catalog as NAVSEA-17.]

Phase I of the effort, the development of a pre-prototype cost model, is planned for completion in April 95. Deliverables to date include a POA&M and Project Definition Report. Further refinement of the production cost model will occur during Phase II (April - Sept 95). RDT&E and Operating and Support modules, and production model upgrades as needed, will be incorporated into the model during Phase III, scheduled for completion by the end of FY98.

**Classification:** Classified/Business Sensitive

**Sponsor:** Naval Sea Systems Command (SEA 0172)

W. N. Summerall, Program Director (703) 602-6575

John Johnston, Technical POC (703) 602-5077

**Performer:** Naval Surface Warfare Center (Code 211)

Carderock Division

Bethesda, Maryland 20084-5000

Michael Jeffers and LCDR Chris Hargreaves

(HME Systems and Cost Model Integration) (301) 227-1941

Naval Surface Warfare Center (Code A50)

Dahlgren Division

Dahlgren, Virginia 22448-5000

John Kozicki (Combat Systems) (703) 663-8308

**Resources:** FY94 FY95 FY96 FY97 FY98 FY99  
\$50K \$50K \$120K \$300K \$150K \$150K

**Schedule:** Start: June 1993

End: September 1999

***Database:*** TBD

***Publications:*** TBD

***Category:*** I.A

***Keywords:*** Government, Estimating, Analysis, Ships, Electronics/Avionics,  
Concept Development, Demonstration/Validation, Labor,  
Materials, Overhead/Indirect, Data Collection,  
Statistics/Regression, CER, Data Base, Method, Computer Model

**Title:** Product-Oriented Design and Construction (PODAC) Cost Model

**Summary:** Develop a cost model that will be sensitive to changes in shipbuilding strategies, ship construction process, use of common modules, zonal architectures, and equipment standardization. Model will assist in assessment of the cost and affordability of design commonality alternatives which have potential for reducing acquisition and ownership costs of ships in conjunction with the NAVSEA Affordability Through Commonality (ATC) Program and the Mid-Term Sealift Ship Technology Development Program (MTSSTDTP).

Currently in concept exploration phase which includes identifying commercially available software and evaluating these and other conceptual models that are being developed by cost research projects: Development of Product-Oriented Cost Estimating Tools and Near-Term Prototype PODAC model. Concept exploration phase will be followed by a demonstration/evaluation phase in which the selected concept(s) is further evaluated and refined. [This task appeared in the 1994 catalog as NAVSEA-18.]

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)

Jerome Acks (703) 602-1308  
DSN 8-332-1308

**Performer:** Naval Surface Warfare Center  
Carderock Division  
Bethesda, Maryland 20084-5000

Robert Jones (301) 227-4102  
DSN 287-4012

**Resources:** FY94 FY95 FY96  
\$0K \$270K TBD

***Schedule:*** Concept Exploration

Start: September 1994

End: June 1995

Prototype Demonstration/Evaluation

Start: July 1995

End: April 1996

Full Scale Development of Model

Start: April 1996

End: November 1997

***Data Base:*** None

***Publication:*** TBD

***Category:*** II.A.2, II.B

***Keywords:*** Government, Estimating, Ships, Production, Labor, Materials, Overhead/Indirect, Engineering, Manufacturing, WBS, Case Study, Survey, Cost/Production Function, Method, Mathematical Model, Study



**Title:** Operating and Support (O&S) Costs for Surface Navy Ships Systems

**Summary:** This effort is directed towards the development of a model to estimate O&S costs of Navy surface ship combat systems to support Milestone 0, I, and II life-cycle cost studies. Initially, the study will use VAMOSC data to develop preliminary CERs. VAMOSC data only represents a portion of the combat system support cost. The study is now in its third phase, collecting and developing CERs to estimate manning and training costs. Additional phases will be necessary to collect data and develop CERs for hardware maintenance. [This task appeared in the 1994 catalog as NAVSEA-19.]

**Classification:** Unclassified (Proprietary)

**Sponsor:** Naval Surface Warfare Center  
Dahlgren Division Center  
Dahlgren, Virginia 22448-5000 (703) 663-7369

**Performers:** Naval Surface Warfare Center  
Dahlgren Division  
Dahlgren, Virginia 22448-5000  
John Kozicki (Code A50) (703) 663-7369

Technomics, Inc.  
5290 Overpass Road, Suite 206  
Santa Barbara, California 93111  
Eugene Waller, Susan Jung (805) 964-9894

**Resources:** \$135K to date, an additional \$150K to complete

**Schedule:** Start: February 1992  
End: 1995

**Data Base:** Currently, VAMOSC data has been used to develop CERs. These initial CERs are being augmented by additional data collection from Navy Training Commands to identify the costs of training, including courses materials, simulators, facilities, etc. Upon completion of this phase, maintenance data and costs will be collected to identify depot maintenance efforts which are not included in the VAMOSC data.

***Publications:*** "Operations and Support Costs of Navy Shipboard Combat Systems," TR-9112-1, September 1992

***Category:*** I.B.1

***Keywords:*** Government, Estimating, Ships, Electronics/Avionics, Operations and Support, Sustainability, Statistics/Regression, Mathematical Model

**Title:** Dynamic Investment Balance Simulator (DIBS) (previously called Planning Under Uncertainty Computer Model)

**Summary:** DIBS is a Navy funded computer model which determines future Navy Force structures that are consistent with a range of possible future funding streams. The model is a hybrid system which uses Excel spreadsheets and macros for input, output, and control of execution and an embedded FORTRAN program as the simulation engine. The model uses a goal-seeking algorithm to develop procurement plans which drive force structure towards specified force objectives stated at the SASDT category level, taking into account planned retirements and attrition of existing assets. When top-line funding is insufficient to achieve the desired force structure size, the goal-seeking algorithm strives to maintain the force structure "shape," that is, the relative numbers of platforms of various types. Operating and support costs of the existing assets are estimated as a function of current force structure. Other Navy budgets elements—RDT&E, WPN, OPN, MILCON, etc.—are estimated using statistical relationships. Force structure is modeled at the ship class and aircraft type model series level of detail. The model has input variables which allow examination of tradeoffs between acquisition (future force structure) and operating and support (maintaining current force structure) in a range of funding environments. The model is also capable of exploring more explicit tradeoffs within limited acquisition categories. A separate but related macroeconomic model capable of generating a range of future Navy funding streams has also been developed as a part of this effort. A prototype version of DIBS was developed during FY93 and successfully demonstrated. Proposals have been submitted for further development and enhancements. [This task appeared in the 1994 catalog as NAVSEA-20.]

**Classification:** Secret

**Sponsor:** Chief of Naval Operations  
Code N812  
Washington, DC 20310

Matt Henry

(703) 697-5242

**Performer:** Michael F. Jeffers, Jr. (Code 211)  
Carderock Division  
Naval Surface Warfare Center  
Bethesda, Maryland 20084-5000 (301) 227-1941

**Resources:** FY94    FY95    FY96  
\$40K    \$125K    \$125K

**Schedule:** Start: February 1993  
Prototype: November 1993  
Enhancements: April 1995 (New Relationships, Excel 5.0);  
September 1995)  
End: TBD

**Data Base:** The model contains a force structure database derived from the SASDT and the Ship Management Information System maintained in the form of an Excel spreadsheet. It also contains data of operating and support cost factors derived from VAMOSC-Ships and VAMOSC-Air, also maintained in Excel spreadsheet form. To remain current these databases must be periodically updated consistent with the sources.

**Publications:** Draft reports describing the DIBS model and its operation have been completed. Relationships currently documented in briefing form.

**Category:** I.A

**Keywords:** Government, Analysis, Forces, Life Cycle, Acquisition Strategy, Statistics/Regression, Economic Analysis, Risk/Uncertainty, Computer Model

**Title:** Research and Development Cost-Estimating Research

**Summary:** This project established procedures for estimating research and development (R&D) costs of Navy systems. The Hull, Mechanical, and Electrical items procedure uses the PRICE H parametric cost model and variable selection guidance. Programs ranging from Advanced Technology Demonstrations to acquisition programs can be estimated. Related work was performed for combat systems and documented separately. [This task appeared in the 1994 catalog as NAVSEA-21.]

**Classification:** Unclassified

**Sponsor:** Naval Surface Warfare Center  
Carderock Division  
Logistics Technology Manager, Code 0116  
Bethesda, Maryland 20084-5000  
Raymond Brengs (301) 227-1026  
  
6.2 Logistics Block Program P.E. 602233N  
Cost Analysis and Acquisition Technology

**Performer :** Naval Surface Warfare Center  
Carderock Division  
Cost and Economic Analysis Branch, Code 211  
Bethesda, Maryland 20084-5000  
Anjali K. Milano (301) 227-5082  
  
Naval Surface Warfare Center  
Dahlgren Division  
Warfare Analysis Division  
Resource Analysis Office, Code A50  
Dahlgren, Virginia 22448-5000  
Ted Towles (703) 663-7369

**Resources:** Completed

**Schedule:** Phase I completed

**Data Base:** The RDT&E historical cost data are implemented on Microsoft Excel spreadsheets using a Macintosh computer. PRICE H and associated vendor communications and analysis software utilize an IBM-compatible personal computer.

**Publications:** "A Method of RDT&E Cost Estimating using the PRICE H Parametric Cost Model," Anjali K. Milano, Robert R. Jones, and Larry K. Wellman, CD-NSWC/SD-92-12 Report, May, 1992.

"A Method of Development Cost Estimating using the PRICE H Parametric Cost Model," Anjali K. Milano, Robert R. Jones, and Larry K. Wellman, Paper Presented to the 26th Annual DOD Cost Analysis Symposium, 9-11 September, 1992.

"Shipboard Combat Systems RDT&E Estimating Methodology Study," draft final report, January 1994

**Category:** I.B.1

**Keywords:** Government, Estimating, Analysis, Ships, EMD, Engineering, Manufacturing, Method

**Title:** The Ship Combat-Systems Estimating and Analysis Model

**Summary:** The Ship Combat-Systems Estimating and Analysis Model (SCEAM) estimates the ship combat system elements for use in total ship cost-estimating models. These estimates could be applied by concept designers in the conceptual stages of combat system development. It contains cost-estimating relationships (CERs) for a selection of Command and Surveillance and Armament to date and will eventually contain all systems in these two areas. These CERs were developed based on contract data and budget data. The model estimates the contractor production costs, including manufacturing and support for the various equipment. [This task appeared in the 1994 catalog as NAVSEA-22.]

**Classification:** Currently the model data is Unclassified; however, future data input could require up to Secret classification.

**Sponsor:** Naval Surface Warfare Center  
Dahlgren Division  
Dahlgren, Virginia 22448-5000  
(703) 663-7369

**Performer:** Naval Surface Warfare Center  
Dahlgren Division  
Dahlgren, Virginia 22448-5000  
Amanda Cardiel (Code A50) (703) 663-7369  
  
Technomics, Inc.  
5290 Overpass Road, Suite 206  
Santa Barbara, California 93111  
(805) 964-9894

**Resources:** \$128K

**Schedule:** Start: August 1991  
End: Phase I completed

**Data Base:** The model is being implemented in Microsoft Excel spreadsheet for the Macintosh and IBM-PC computers. All data required to run the model are contained in spreadsheets. The CERs are derived from budgetary and contract data. The user inputs values for the technical and budgetary parameters required and the model calculates the production cost. This cost includes factors for learning curves, inflation and production support.

**Publications:** "Cost Estimating and Analysis Model for Advanced Ship Combat Systems," TR-9111-1, August 1992

**Category:** I.B.1

**Keywords:** Government, Estimating, Ships, Electronics/Avionics, Production, Data Collection, Computer Model



**Title:** Fleet-Wide Cost/Benefit Assessment

**Summary:** Update and analyze proposed notional fleets and develop criteria for definition of notional fleets, directed at most clearly showing the effects of ATC implementation on a fleet-wide basis. Develop a methodology for conducting return on investment (ROI) analysis for the overall ATC program and for individual ATC modules.

**Classification:** Business Sensitive

**Sponsor:** Naval Sea System Command (SEA 017R/SEA 03R3)  
Jerome Acks (703) 602-1308  
DSN 8-332-1308

**Performer:** Naval Surface Warfare Center  
Carderock Division  
Bethesda, Maryland 20084-5000  
Robert Jones (301) 227-4102  
DSN 8-287-4012

<b>Resources:</b>	<u>FY94</u>	<u>FY95</u>	<u>FY96</u>	<u>FY97</u>	<u>FY98</u>
	\$0K	\$110K	\$50K	\$50K	TBD

**Schedule:** Start: October 1994  
End: September 1998

**Data Base:** None

**Publications:** Study Report

**Category:** II.B

**Keywords:** Industry, Analysis, Estimating, Ships, Production, Labor, Materials, Overhead/Indirect, Engineering, Method, Study

**AIR FORCE MATERIAL COMMAND/  
AERONAUTICAL SYSTEMS CENTER**

<b>Name</b>	Cost Division Directorate of Financial Management and Comptroller Air Force Materiel Command/Aeronautical Systems Center		
<b>Address</b>	ASC/FMC, Bldg 11A 1970 Third St, Suite 6 Wright-Patterson AFB, OH 45433-7213		
<b>Director</b>	Donna J. Vogel	(513) 255-6483	
<b>Size</b>	Professional:	45	
	Support:	6	
	Consultants:	0	
	Subcontractors:	0	
<b>Focus</b>	Cost Estimating and Research, Resources Analysis (Source Selection Policy and Estimates); Scheduling; Performance Measurement Systems and Analysis; Independent Review Team support; Integrated Risk Management; Program Support Cost Operational Effectiveness Analysis		
<b>Activity</b>	Number of projects in progress:	2	
	Typical duration of a project:	Dependent on available resources	
	Typical number of staff members assigned to a project:	Dependent on available resources	
	Typical number of staff-years expended per project:	0.5	
	Percent of effort conducted by consultants	0%	
	Percent of effort conducted by subcontractors	50%	

**Title:** Aeronautical Systems Center (ASC) Cost/Schedule Research Roadmap (FY95)

**Summary:** An effort to define cost and schedule research requirements and plan for the collection of the required data to support cost estimating and scheduling efforts for ASC programs, such as aircraft modifications, new efforts like the Joint Advanced Strike Technology (JAST) Program and evaluating concepts derived from the Technical Planning Integrated Product Teams (TPIPTs). The effort will look at ways of collecting data that is in traditional formats as well as innovative formats, such as by process. This effort is a new listing to the *IDA Cost Research Symposium Report*.

**Classification:** Unclassified

**Sponsor:** ASC/FMC

Donna J. Vogel (513) 255-6483  
DSN 785-6483

**Performer:** ASC/FMCE

Kathy Watern (513) 255-6347  
DSN 785-6347

**Resources:** Dollars: 0  
Staff-years: .5

**Schedule:** Start: August 1994  
End: December 1995

**Data Base:** N/A

**Publications:** N/A

**Category:** I.A.1, I.B, II.A, II.B, II.D

**Keywords:** Government, Estimating, Weapon Systems, Aircraft, Concept Development, Demonstration/Validation, EMD, Production, Labor, Material, Data Collection, Data Base

**Title:** Advanced Aircraft Cost Forecasting Model (AACFM)

**Summary:** The purpose of this model is to estimate air vehicle life cycle costs in Concept Exploration and Engineering and Manufacturing Development environments. Typically early in a program's life cycle few precise well defined parameters exist for cost modeling. This model uses an approach similar to the Price models but requires fewer input parameters. Currently, the airframe, avionics, engine, Operating and Support (O & S), risk analysis modules are well defined. The remaining effort focuses on expanding the database detail to lower levels and expanding the database to include helicopter and special operations aircraft. The database is currently unclassified but easy to populate with classified data by the ultimate user. The operating handbook is in draft form. [This task appeared in the 1994 catalog as ASC/FMC-5.]

**Classification:** Unclassified

**Sponsor:** Mr. Patrick Cyrus  
ASC/XRPC  
1970 Third Street, Suite 2                      DSN 785-9697  
WPAFB, OH 45433-7209                      (513) 255-9697

**Performer:** Mr. Charles Hopkins  
ECON Incorporated  
4020 Moorpark Avenue, Suite 216  
San Jose, CA 95117                      (408) 249-6364  
  
Mr. Robert Phillips  
Econ Incorporated  
711 West Bay Area Blvd.  
Webster, TX 77598                      (713) 554-4481

**Resources:** Dollars:                      \$745,542 (Phase II)  
Total Labor Hours:    4,475  
Fiscal Years Involved:       FYs 94 and 95  
Staff-years:

**Schedule:** Start: April 1994 (Phase IIB)  
End: November 1995 (Phase IIB)

**Data Base:**    System Level:  
Program go-ahead data  
First flight date  
Year of initial operating capability  
Number of test aircraft  
Number of production aircraft

Hardware Level:  
Number of engines per aircraft  
Aircraft empty weight  
Subsystem state-of-the-art rating  
Subsystem operating environment  
Cost for unit 100

Software:  
Software complexity rating  
Software function  
Percent new design  
Number of lines of code  
Software certification level  
Operating environment  
Composite hourly rate for labor

Integration:  
Development integration complexity rating  
Production integration complexity rating

**Publications:**    None to date

**Category:**        II.A.2

**Keywords:**        Government, Estimating, Electronics/Avionics, Weapon Systems,  
Life Cycle, Engineering, Manufacturing, Mathematical Modeling,  
Mathematical Model

**AIR FORCE SPACE AND MISSILE SYSTEMS CENTER**

**Title:** Update of ACE-IT with Unmanned Spacecraft Cost Model (USCM) 7

**Summary:** Input new cost estimating relationships (CERs) of USCM7 in Automated Cost Estimating Integrated Tools (ACE-IT). [This task appeared in the 1994 catalog as AFSMC -11.]

**Classification:** Unclassified

**Sponsor:** SMC/FMC

**Performer:** SMC/FMC  
Contractor—Tecolote Research, Inc.

Ms. Phu Nguyen (310) 363-0071

**Resources:** Dollars: FY 94, \$150,000  
Staff-years:

**Schedule:** Start: September 1994  
End: May 1995

**Data Base:** Description: Includes cost, technical and programmatic data by WBS at the spacecraft component level. Database is contained in Lotus spreadsheet and Dbase IV.  
Automation: PC

**Publications:** Title: "Unmanned Spacecraft Cost Model, 7th Edition"  
Author(s): Space and Missile Systems Center/FMC

**Category:** II.A.2

**Keywords:** Government, Estimating, Space Systems, EMD, Production, WBS, CER, Statistics/Regression, Data Base



**Title:** Hazardous Materials Disposal Cost Study

**Summary:** The OSD Cost Analysis Improvement Group (CAIG) is requiring all programs to include the costs of disposing of hazardous waste in their program/life-cycle cost estimates. Few programs have included these costs in their estimates and some do not include all the costs. This is the second part of a study to define the types of costs related to hazardous waste disposal, determine what part of the life cycle will be impacted by these costs, and develop CERs to estimate those costs. This task will consist of developing a handbook of cost methodologies for dealing with environmental mitigation and a training program to provide assistance to program office cost estimators on how to apply the handbook methodologies. [This task appeared in the 1994 catalog as AFSMC-2.]

**Classification:** Unclassified

**Sponsor:** SMC/FMC

**Performer:** SMC/FMC  
FFRDC—Aerospace Corporation  
Contractor—EER Systems

Ms. Mary H. Alverio (310) 363-2822

**Resources:** Dollars: FY 94 \$60,094  
FY95 \$103,000

Staff-years: .1

**Schedule:** Start: May 1995  
End: April 1996

**Data Base:** Handbook of cost methodologies for estimating the cost of environmental mitigation strategies, hazardous material cleanup, and planning for use of non-hazardous materials.  
Automation: TBD

**Publications:** Title: Space and Missile Systems Center Environmental Cost Handbook

Author(s): Space and Missile Systems Center/FMC

**Category:** I.C, II.C

**Keywords:** Government, Estimating, Life Cycle, Space Systems, Missiles,  
Environment, Data Collection, Study

**Title:** Software Data Base (Phase VI)

**Summary:** Maintained the SMC Software Data Base by adding new data. Modified automated and stand-alone tool to work in windows. Normalized missing parameters. DoD's largest software database. [This task appeared in the 1994 catalog as AFSMC -3.]

**Classification:** Unclassified (Proprietary and Non-Proprietary versions)

**Sponsor:** SMC/FMC

**Performer:** SMC/FMC  
FFRDC—Aerospace Corporation  
Contractors—Management Consulting & Research, Inc., Galorath Associates, Inc., Cost Management Systems, Inc.

Ms. Gina Novak-Ley (310) 363-1629  
Ms. Shirley Tinkler (310) 363-5057

**Resources:** Dollars: \$673,000 prior years  
\$148,000 FY94  
Staff-years: .2

**Schedule:** Start: September 1994  
End: August 1995

**Data Base:** SMC Software Development Database  
Description: Contains cost and sizing from space, ground mobile, and airborne platforms. Hosted in dBase IV.  
Automation: PC

**Publications:** Title: 1. SMC Software Database Final Report (Phase 5)  
2. SWDB Users Manual  
Authors(s): Space and Missile Systems Center/FMC

**Category:** II.A.2

**Keywords:** Government, Estimating, Space Systems, EMD, Production, Modification, WBS, Size, Data Collection, Database, Method

**Title:** Operations and Support (O&S) Data Base

**Summary:** Populate fields of data base. Will modify automated stand-alone tool to work in Windows. Database contains data that can be used for analogy estimates, calibration efforts, and CER development, and is compatible with current Air Force computer systems. [This task appeared in the 1994 catalog as AFSMC -4.]

**Classification:** Unclassified (Proprietary and Non-Proprietary versions)

**Sponsor:** SMC/FMC

**Performer:** SMC/FMC  
FFRDC—Aerospace Corporation  
Contractors—Management Consulting & Research, Inc., Cost Management Systems, Inc.

Ms. Gina Novak-Ley (310) 363-1629

**Effort:** Dollars: \$596,000 prior year  
\$30,000 FY94  
Staff-years:

**Schedule:** Start: September 1994  
End: August 1995

**Data Base:** SMC Operations and Support (O&S) Database  
Description: Contains cost and technical data for O&S space, ground, mobile, and airborne platforms. Hosted in dBase IV.  
Automation:

**Publications:** Title: 1. SMC O&S Database Final Report (Phase 2)  
2. OSDB Users Manual  
Authors(s): Space and Missile Systems Center/FMC

**Category:** II.A.2

**Keywords:** Government, Estimating, Space Systems, Operations and Support, WBS, Size, Data Collection, Data Base, Method

**Title:** Risk Study

**Summary:** Develop and/or understand the relationship between the most likely estimate multiplier from the scaling approach or AHP and the true risk impacts on costs. [This task appeared in the 1994 catalog as AFSMC -5.]

**Classification:** Unclassified

**Sponsor:** SMC/FMC

**Performer:** SMC/FMC,  
FFRDC—Aerospace  
Contractor—Management Consulting and Research

David Graham (310) 363-0131

**Resources:** Dollars: \$107,160 prior years  
\$25,500 FY 94

Staff-years:

**Schedule:** Start: October 1994  
End: June 1995

**Data Base:** Risk Database

Description: Include cost, technical, and programmatic data

Automation: TBD

**Publications:** Title: TBD

Author(s): Space and Missile System Center/FMC

**Category:** I.B.2, II.C

**Keywords:** Government, Estimating, Space Systems, EMD, Production, WBS, Data Collection, Survey, Risk/Uncertainty, Statistics/Regression, Method, Study

**Title:** SEER-H Calibration

**Summary:** Modify the SEER-H Model input parameters to better represent SMC projects. [This task appeared in the 1994 catalog as AFSMC-8.]

**Classification:** Unclassified

**Sponsor:** SMC/FMC

**Performer:** SMC/FMCC  
Contractor—Galorath Associates

Mr. David Graham (310) 363-0131

**Resources:** Dollars: \$150,000 FY94  
Staff-years: .2

**Schedule:** Start: September 1994  
End: January 1995

**Data Base:** SMC peculiar input parameters for the SEER-H Model

**Publications:** Title: Space and Missile Systems Input Parameters for the SEER-H Model  
  
Author(s): Space and Missile Systems Center/FMC

**Category:** II.A.2

**Keywords:** Government, Industry, Estimating, Space Systems, Labor, Material, EMD, Production, WBS, Data Collection, Mathematical Modeling

**Title:** Sensor Model Update

**Summary:** The methods for estimating space sensors payloads (passive sensors, e.g., infrared) need to be updated. Subsystems reviewed were focal plane arrays, optical telescope assemblies, cryogenic coolers, servo-electronics, gimbals and structures, star sensors, power supplies, and sensor integration, assembly and test.

**Classification:** Unclassified (Proprietary data base separately bound)

**Sponsor:** SMC/FMC

**Performer:** SMC/FMC  
Contractor—Management Consulting & Research, Inc.  
  
Ms. Phu Nguyen (310) 363-0071

**Resources:** Dollars: \$555,000 prior year  
\$30,000 FY94  
  
Staff-years:  
  
Start: October 1994  
End: May 1995

**Data Base:** Sensor data base  
  
Description: Contains cost, technical, and programmatic data, by WBS at the sensor component level.  
  
Automation: PC

**Publications:** Title: "Passive Sensor Cost Model"  
Authors: Space and Missile System Center/FMC.

**Category:** II.A.2

**Keywords:** Government, Estimating, Space Systems, Electronics/Avionics, EMD, Production, WBS, Data Collection, Survey, CER, Statistics/Regression, Method

**Title:** Unmanned Spacecraft Cost Model (USCM) Update

**Summary:** Update the 7th Edition (1994) of the model with developing, validating, documenting new CERs, and obtaining new data points. [This task appeared in the 1994 catalog as AFSMC -10.]

**Classification:** Unclassified (Proprietary data base separately bound)

**Sponsor:** SMC/FMC

**Performer:** SMC/FMC  
FFRDC - Aerospace Corporation  
Contractor - Tecolote Research, Inc.

Ms. Phu Nguyen (310) 363-0071

**Resources:** Dollars: \$1,179,000 prior years  
\$150,000 FY94  
Staff-years: .3

**Schedule:** Start: June 1994  
End: June 1995

**Data Base:** USCM Data Base  
Description: Includes cost, technical, and programmatic data, by WBS at the spacecraft component level. Data base is contained in Lotus spreadsheets and dBase IV.  
Automation: PC

**Publications:** Title: "Unmanned Spacecraft Cost Model, 7th Edition"  
Author(s): Space and Missile Systems Center/FMC,

**Category:** II.A.2, II.B

**Keywords:** Government, Estimating, EMD, Space Systems, Production, WBS, CER, Mathematical Modeling, Statistics/Regression, Data Base, Method, Mathematical Model



**Title:** Ground Station Cost Model

**Summary:** Completed the final documentation for estimating fixed, transportable, and mobile facility costs and hardware items related to the space support ground stations. [This task appeared in the 1994 catalog as AFSMC -1.]

**Classification:** Unclassified

**Sponsor:** SMC/FMC

**Performer:** SMC/FMC  
FFRDC-Aerospace Corporation  
Contractor—Management Consulting and Research, Inc.

Ms.Gina Novak-Ley (310) 363-1629

**Resources:** Dollars: \$120,160 FY93  
Staff-years:

**Schedule:** Start:  
End: Completed November 1994

**Data Base:** Final documentation included catalog prices, and technical and programmatic data related to space ground stations  
Automation:

**Publications:** Title: "Space and Missile Systems Center Ground Station Cost Model."  
Author(s): Space and Missile Systems Center/FMC

**Category:** II.A.1

**Keywords:** Government, Estimating, EMD, Space Systems, Production, WBS, CER, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Mathematical Model

## **HUMAN SYSTEMS CENTER**

<b><i>Name</i></b>	Weapon System Pollution Prevention Division (HSC/EMP) Human Systems Center, Air Force Materiel Command		
<b><i>Address</i></b>	8213 14th Street Brooks AFB, TX 78235-5246		
<b><i>Director</i></b>	Mr. David V. Zapata	(210)536-5120	
<b><i>Size</i></b>	Professional:	23 (authorized) 22 (assigned)	
	Support:	4 (authorized) 4 (assigned)	
<b><i>Focus</i></b>	Development and fielding of management tools and training designed to assist Air Force Single Managers in institutionalizing pollution prevention in Air Force weapon systems. Provide an information exchange service to the Air Force Weapon System community to aid in complying with Federally mandated ODC reduction goals.		
<b><i>Activity</i></b>	Number of projects in progress:		7
	Average duration of a project:	3 days to 3 years	
	Average number of staff members assigned to a project:	1-6	
	Average number of staff-years per project:	3 days - 3 years	
	Percent of effort conducted by consultants:	70%	
	Percent of effort conducted by subcontractors:	0%	

**Title:** HazMat Model Cost Trade-Off Analysis Tool

**Summary:** One of three modules of the HazMat Model. This tool is weapon system oriented, chemical specific by process within one of the three phases of the weapon system life cycle; surfaces the costs of protecting human health and the environment that were previously hidden in overhead costs; provides program offices and engineers the capability to perform cost trade-off studies between hazardous and less hazardous or nonhazardous materials; provides data to document the life cycle cost impacts of using hazardous materials on a weapon system; the environmental cost data can be used to support decision making in pollution prevention programs.

**Classification:** Unclassified

**Sponsor:** HSC/EMP,  
8213 14th Street,  
Brooks AFB, TX 78235-5246

Ms. Betty S. West (210) 536-5121

**Performer:** TASC  
Mr. John Long (513) 426-1040

<b>Resources:</b>	<u>Dollars</u>	<u>Staff-years</u>
FY90	\$475,758	2.6
FY91	\$655,880	3.8
FY92	\$456,060	2.9
FY93	\$1,207,067	6.5
FY95	\$911,445	4.4

**Schedule:** Start: 1990  
End: June 1996

**Data Base:** HAZMAT

Description: Hazardous materials cost element data for production, maintenance and decommissioning of weapon systems (F-16, F-15, B-1, C-130, Titan IV, Black Hawk, Mark 50, M1-A1)

Automation: PC in Ada, currently being converted to Windows based software.

***Publications:*** Hazardous Materials Life Cycle Cost Estimator, Version 3.1,  
User's Guide

Hazardous Materials Life Cycle Cost Estimator, Version 3.1,  
Methodology Manual

***Category:*** I.C., II.A.1, II.A.2

***Keywords:*** Industry, Government, Estimating, Analysis, Weapon Systems,  
Operations and Support, Life Cycle, Labor, Material,  
Overhead/Indirect, Environment, Data Collection, Economic  
Analysis, Data Base

**Title:** HazMat Model Manufacturing and Maintenance Process Cost Analysis Tool

**Summary:** One of three modules of the HazMat Model. This tool is process oriented; estimates the total costs for a process life cycle; captures the environmental costs as a subset of the direct and indirect costs of a process; provides program offices and engineers the capability to perform process analyses and cost trade-off studies between hazardous and less hazardous or nonhazardous material inputs into a process; provides data to document the cost impacts of using hazardous materials in a manufacturing or maintenance process; the environmental cost data can be used to support decision making in pollution prevention programs.

**Classification:** Unclassified

**Sponsor:** HSC/EMP,  
8213 14th Street,  
Brooks AFB, TX 78235-5246

Ms. Betty S. West (210) 536-5121

**Performer:** Parsons Engineering Science, Inc.  
Mr. Dale Rice (703) 934-2348

<b>Resources:</b>	<u>Dollars</u>	<u>Staff-years</u>
FY95	\$338,524	1.3

**Schedule:** Start: April 1995  
End: 1998

**Data Base:** HAZMAT

Description: Direct and indirect cost data for five common maintenance processes at Air Force Logistics Centers

Automation: PC in Windows based software

**Publications:**

**Category:** I.C., II.A.1, II.A.2

***Keywords:*** Industry, Government, Estimating, Analysis, Weapon Systems, Operations and Support, Life Cycle, Labor, Material, Overhead/Indirect, Environment, Data Collection, Economic Analysis, Data Base

**Title:** HazMat Model Material Cost Analysis Tool

**Summary:** One of three modules of the HazMat Model. This tool estimates the costs of using hazardous materials at a facility and the risk to human health and the environment from those hazardous materials; provides program offices and engineers the capability to assess the costs and risks of using hazardous materials; provides data to document the cost and risk impacts of using hazardous materials at a facility; the environmental cost and risk data can be used to support decision making in pollution prevention programs.

**Classification:** Unclassified

**Sponsor:** HSC/EMP,  
8213 14th Street,  
Brooks AFB, TX 78235-5246

Ms. Betty S. West (210) 536-5121

**Performer:** Labat-Anderson Incorporated  
Mr. Joe Martin (303) 987-0221

<b>Resources:</b>	<u>Dollars</u>	<u>Staff-years</u>
FY95	\$602,828	1.7

**Schedule:** Start: April 1995  
End: 1998

**Data Base:** HAZMAT

Description: Hazardous materials cost element data for the use of hazardous materials at a facility. Chemical toxicity/hazard factors for health and environmental risks.

Automation: PC in Windows based software.

**Publications:**

**Category:** I.C., II.A.1, II.A.2

**Keywords:** Industry, Government, Estimating, Analysis, Weapon Systems, Operations and Support, Life Cycle, Labor, Material, Overhead/Indirect, Environment, Data Collection, Economic Analysis, Data Base



**THE RAND CORPORATION**

<b><i>Name</i></b>	No formal cost research organization exists at RAND. Analysts involved in military cost research are divided between two separate departments: Human & Material Resources Policy (HMRP), and Defense Planning and Analysis (DPA). Adele Palmer, Associate Corporate Research Manager (HMRP), has responsibility for RAND's cost analysis activities.		
<b><i>Address</i></b>	1700 Main Street Santa Monica, CA 90406-2138		
<b><i>Director</i></b>	Fred Timson		
<b><i>Size</i></b>	Professional:	7	
	Support:	.5	
	Consultants:	2 (0.2 man-years)	
	Subcontractors:	0	
<b><i>Focus</i></b>	Force costing, O&S costing, system costing, space systems		
<b><i>Activity</i></b>	Number of projects in progress:	6	
	Air Force sponsored:	3	
	OSD sponsored:	3	
	Typical duration of a project:	1-2 years	
	Typical number of staff members assigned to a project:	1-3	
	Typical number of staff-years expended per project:	.5 to 4	
	Percent of effort conducted by consultants	<5%	
	Percent of effort conducted by subcontractors	0%	

**Title:** Projecting Defense Acquisition Spending

**Summary:** The objective of this project is to develop a micro-computer-based software package to forecast long-term (through 2030) total DoD RDT&E and procurement spending, based on major weapon system/hardware inventories, retirement schedules, and replacement. [This task appeared in the 1994 catalog as RAND-5.]

**Classification:** Unclassified

**Sponsor:** OUSDA&T

**Performer:** RAND  
Fred Timson (310) 393-0411

**Resources:** Dollars:  
Staff-years:

**Schedule:** Start: March 1991  
End: September 1995

**Data Base:** Schedule/costs  
Description: Major weapon system/hardware inventories, procurement/replacement  
Classification: Unclassified  
Automation: PC (Excel) - The RAND Defense Acquisition Projection System (RDAPS)

**Publications** The RAND Defense Acquisition Projection System: A User's Guide," DRR-416-1-ACQ, C.R. Neu, Richard A. Krop, and Fred Timson, October 1994, Unclassified (distribution of RAND drafts controlled by sponsor)

**Category:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Forces, Mathematical Modeling, Computer Model

**Title:** Military Aircraft Cost Data Base

**Summary:** The objective of this project is to develop a historical aircraft data base in collaboration with the other services. The data base will contain functional labor and material costs for EMD and each production buy. CFE avionics will be broken out my major system (e.g. radar, EW, etc.) to the extent possible. Weight and descriptive data will be obtained to reflect various model changes. Programmatic data will include schedules, quantities, model/block numbers, and EMD program characteristics. Focus is on F-14, F-15, F-16, F/A-18, and AV-8B. [This task appeared in the 1994 catalog as RAND-7.]

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** RAND  
                     Fred Timson                      (310) 393-0411  
                     Rob Leonard                     (310) 393-0411

**Resources:** Dollars:  
                     Staff-years:

**Schedule:** Start: July 1993  
                     End: September 1995

**Data Base:** Classification: Unclassified; Contractor Proprietary  
                     Automation: PC (Excel)

**Publications** None

**Category:** I.D, II.A.1

**Keywords:** Industry, Reviewing/Monitoring, Aircraft, Airframe, Structure, Subsystems, Electronics/Avionics, EMD, Production, Labor, Material, WBS, Data Collection, Data Base

**Title:** Weapon System Cost Drivers

**Summary:** A greatly reduced defense business base, creating the prospect of many fewer defense programs and much lower production rates, has dramatically changed the acquisition environment. These changes are occurring even as a "manufacturing revolution" is underway, as a result of new management and "factory floor" techniques such as concurrent engineering, computerized production, lean manufacturing and others. These changes raise the question of which factors are likely to drive the costs of future military aircraft, particularly the F-16 replacement. After identifying aircraft components that are likely to be major cost drivers, the study will examine changes to "factory floor" processes with the intent of identifying cost estimating techniques that are no longer appropriate. Approaches for tailoring, modifying or manipulating historical data to reflect current and future environments will be explored.

**Classification:** Unclassified

**Sponsor:** Office of the Assistant Secretary of the Air Force  
(Financial Management & Comptroller).

**Performer:** RAND  
Dennis Smallwood (310) 393-0411

**Resources:** Dollars:  
Staff-years:

**Schedule:** Start: December 1994  
End: March 1996

**Data Base:**

**Publications** None

**Category:** II.D

**Keywords:** Government, Estimating, Aircraft, EMD, Production, Labor, Material, Overhead/Indirect, Statistics/Regression, Study

**Title:** Air Force O&S and Force Cost Analysis

**Summary:** This study encompasses improved resource/cost modeling, data base development, and development of data management tools to support long-range force structure planning and analysis aimed at determining the size and composition of future air forces. (This task appeared in the 1994 catalog as RAND-11).

**Classification:** Unclassified

**Sponsor:** AF/XOF

**Performer:** RAND  
                   Gary Massey                   (310) 393-0411  
                   Kirn Braich                   (310) 393-0411

**Resources:** Dollars:  
                   Staff-years:

**Schedule:** Start: October 1993  
                   End: September 1995

**Data Base:** Data base tools to extract and consolidate data from AF PPBS data bases and resource/cost factor tables (AFR 65-203 and other table, to be developed) to support force resource/cost models. UNIX workstation, DOS and Macintosh.

**Publications** None

**Category:** II.A.1, II.A.2, II.C

**Keywords:** Government, Analysis, Forces, Operations and Support, Life Cycle, Method, Computer Model, Data Base

**THE MITRE CORPORATION**

<b><i>Name</i></b>	Economic and Decision Analysis Center, The MITRE Corporation		
<b><i>Address</i></b>	7525 Colshire Drive McLean, VA 22102-3481		
<b><i>Director</i></b>	Dr. William P. Hutzler	(703) 883-6911	
<b><i>Size</i></b>	Professional:	120	
	Support:	20	
	Consultants:	0	
	Subcontractors:	0	
<b><i>Focus</i></b>	C3I and IT, Systems Cost, Life-Cycle Costs, Acquisition Cost, Program Management Cost, Decision Analysis, Risk Analysis		
<b><i>Activity</i></b>	Number of projects in progress:	220	
	Typical duration of a project:	1/2 year	
	Typical number of staff members assigned to a project:	2-4	
	Typical number of staff-years expended per project:	1/2 year	
	Percent of effort conducted by consultants	0%	
	Percent of effort conducted by subcontractors	0%	



**Title:** Economics of Commercial-Off-The-Shelf (COTS)

**Summary:** Develop a comprehensive methodology to estimate the cost of COTS software integration, and develop a framework for scaling the complexity of COTS software integration. [This task appeared in the 1994 catalog as MITRE-3.]

**Classification:** Unclassified

**Sponsor:** MITRE Washington Economic and Decision Analysis Center  
7525 Colshire Drive  
McLean, VA 22102  
Pam Geriner (703) 883-5488

**Performer:** Evelyn Robinson (703) 883-3747  
John Yost (703) 883-3669

**Resources:** Dollars: FY 1995  
Staff-years: 2.0

**Schedule:** Start: November 1994  
End: September 1995

**Data Base:** N/A

**Publications:** "Integrated Commercial-Off-The-Shelf Software Implementation Cost Estimation Methodology," E. M. Robinson, Unclassified; briefings

**Category:** I.A

**Keywords:** Government, Estimating, Infrastructure, Life Cycle, Integration, Engineering, Variable Costs, Economic Analysis, Method, Study

**Title:** Information Technology Total Cost of Ownership Model

**Summary:** This project is developing a prototype cost-estimating model that can be used for both ROM parametrics estimates and more detailed estimates, depending upon the availability of technical definition. The model will estimate acquisition, maintenance, and support costs of COTS hardware and software products, and can be used for project planning, program execution, operations analysis, and planning migrations and upgrades.

**Classification:** Unclassified

**Sponsor:** MITRE Tool Development Funds

**Performer:** MITRE  
Mr. Jack Heine (617) 271-6468

**Resources:** Dollars: \$50K  
Staff-months: 6.0

**Schedule:** Start: March 1995  
End: September 1995

**Data Base:** Data are drawn from industry publications (Gartner Group, IDC, M.A.I.D., etc.)

**Publications:** None

**Category:** II.D

**Keywords:** Industry, Budgeting, Electronics/Avionics, Life Cycle, Automation, Economic Analysis, Computer Model

**Title:** Ordinal Ranking Methods for Multicriteria Decision Making

**Summary:** The effectiveness portion of a Cost and Operational Effectiveness Analysis (COEA) often requires that alternatives be ranked based on the computed scores for a number of criteria. Ranking methods are either cardinal or ordinal. Ordinal methods require only that the rank order of the alternatives be known for each criterion and have the following advantages: independence assumptions are not needed for the criteria; and subjective assessments (such as for constructing utility curves) are not needed. This research project investigates and compares five ordinal ranking methods, establishes many new theoretical results, analyzes how well the methods meet the special requirements of a COEA, and applies them to several COEAs.

**Classification:** Unclassified

**Sponsor:** Economic and Decision Analysis Center, MITRE

**Performer:** MITRE  
Dr. Zachary F. Lansdowne (617) 271-6244

**Resources:** Dollars: FY 1995  
Staff-months: 6.0

**Schedule:** Start: October 1994  
End: September 1995

**Data Base:** None

**Publications:** TBD

**Category:** II.A.2, II.D

**Keywords:** Government, Analysis, Weapon Systems, Concept Development, Acquisition Strategy, Economic Analysis, Method

**Title:** COTS Logistics and Support Strategies

**Summary:** This project investigates logistics and support strategies for Commercial Off-The-Shelf/Non-Development Items (COTS/NDI) in order to recommend methodologies and cost-effective strategies to the Air Force. Our approach is to conduct a literature review, survey COTS/NDI intensive projects, compile economic analysis models, and develop guidelines for replacement and support decisions.

**Classification:** Unclassified

**Sponsor:** Systems Engineering Process Office, MITRE

**Performer:** MITRE  
Dr. Zachary F. Lansdowne (617) 271-6244

**Resources:** Dollars: FY 1995  
Staff-months: 6.0

**Schedule:** Start: January 1995  
End: September 1995

**Data Base:** Survey data

**Publications:** TBD

**Category:** II.A.1, II.A.2

**Keywords:** Government, Analysis, Spares/Logistics, Operations and Support, Sustainability, Economic Analysis, Study

**Title:** Software Engineering Life Cycle: A Dynamic View

**Summary:** The objective of this project is to establish a software engineering life-cycle paradigm. To define this paradigm, we will develop a dynamic process model for the software life cycle that provides (1) detailed software life-cycle resource estimation and (2) high-level strategy trade-off analysis capabilities. This dynamic model will allow a program manager to evaluate the effect of decisions regarding the various phases of the software life cycle. A program manager must decide where in the life cycle project resources would be best spent in order to develop reliable, high-quality software. For example, should the money be spent to develop a better software design or perform extensive testing in the development phase, or would it be better to wait for the maintenance phase to correct and improve the software? The tools to be developed under this project will permit these types of strategic trade-off analyses to facilitate software project management throughout the software life cycle. The current phase of this project includes developing the software manager interface and scenarios for a problem solver tutorial. In addition, a data collection effort is underway to populate and validate the system dynamics model. [This task appeared in the 1994 catalog as MITRE-4.]

**Classification:** Unclassified

**Sponsor:** The MITRE Corporation

**Performer:** Economic and Decision Analysis Center  
The MITRE Corporation  
7525 Colshire Drive  
McLean, VA 22102

Pamela T. Geriner	(703) 883-5488
Henry Neimeier	(703) 883-7485
Timothy Robinson	(703) 883-6465
C. C. Cho	(617) 271-6287

**Resources:** Dollars:  
Staff-years: 2.13 (FY94)  
                  3.00 (FY95)

***Schedule:*** Start: October 1993

End: Multi-year project

***Data Base:*** Software Life Cycle Process and Metric Data Base

This data base will include both government and industry product and process characteristics. The data will be both cross sectional (across programs) and time series (tracking each program through time). In addition to the metrics collected, a process data base will be linked to the metrics data base for each program which will permit relationships between organizational process characteristics and program costs to be evaluated.

***Publications:*** "Dynamic Software Life Cycle Model," H. A. Neimeier, International System Dynamics Conference Proceedings, briefings

***Category:*** I.A.1, I.A.2, I.B.2, I.D, II.A.2, II.B, II.C, II.D

***Keywords:*** Government, Industry, Analysis, Weapon Systems, Infrastructure, Facilities, Manpower/Personnel, Life Cycle, Fixed Costs, Variable Costs, Acquisition Strategy, Risk/Uncertainty, Training, Schedule, Data Collection, Mathematical Modeling, Economic Analysis, Time Series, Data Base, Method, Mathematical Model, Computer Model

**Title:** Forecasting PC Price Trends

**Summary:** The decision of when to buy computer equipment is confounded by the fact that prices for a given capability continue to decline but newer and more advanced capabilities are simultaneously being introduced to the market. This paper describes a method for modeling and forecasting price data for PCs and their components that will assist decision makers. Time series representing quarterly values of price indices of PCs and their components will be examined. Vector ARMA model are fit to this collection of times series by the use of MAP estimators. Intervention analysis will be applied to these models to investigate the effects on the indices of the high rate of technological change in this industry.

**Classification:** Unclassified

**Sponsor:** The MITRE Corporation

**Performer:** Economic Analysis Center  
The MITRE Corporation  
7525 Colshire Drive  
McLean, VA 22102  
  
Paul M. Hriljac (703) 883-6371  
Pamela T. Geriner (703) 883-5488

**Resources:** Dollars: \$  
Staff-years: .2

**Schedule:** Start: February 1995  
End: June 1995

**Data Base:** N/A

**Publications:** Technical report; briefings

**Category:** II.A.2, II.B, II.C

**Keywords:** Government, Analysis, Infrastructure, Life Cycle, Advanced Technology, Risk/Uncertainty, Mathematical Modeling, Time Series, Mathematical Model

**LOGISTICS MANAGEMENT INSTITUTE**



<b>Name</b>	Logistics Management Institute		
<b>Address</b>	2000 Corporate Ridge McLean, VA 22102-7805		
<b>Director</b>	Edward D. Simms, Jr.	(703) 917-7221	
<b>Size</b>	Professional:	7	
	Support:	.5	
	Consultants:	2	
	Subcontractors:	0	
<b>Focus</b>	Infrastructure costs, manpower costs, operating and support costs for weapon systems		
<b>Activity</b>	Number of projects in progress:	5	
	Typical duration of a project:	1.5 years	
	Typical number of staff members assigned to a project:	2	
	Typical number of staff-years expended per project:	2	
	Percent of effort conducted by consultants	20%	
	Percent of effort conducted by subcontractors	20%	

**Title:** Accrual Accounting for Post-Retirement Military Health Care

**Summary:** Develop a plan for accrual accounting of retirement health care provided by DoD through Military Treatment Facilities and CHAMPUS to retired military service members and their dependents and survivors. [This task appeared in the 1994 catalog as LMI-3.]

**Classification:** Unclassified

**Sponsor:** DoD Office of the Actuary  
Benjamin Cottlieb (703) 696-5869

**Performer:** Logistics Management Institute  
6400 Goldsboro Road  
Bethesda, MD 20817  
Mr. Mel Etheridge (703) 917-7307

**Resources:** Dollars:  
Staff-years: 5 man-years

**Schedule:** Start: September 1990  
End: December 1995

**Data Base:** None

**Publications:** LMI Report CO101R1, "Accrual of Military Retirement Health Care." January 1992, Melvin R. Etheridge, Jr., Edward D. Simms, Jr., and Irv Greenberg  
LMI Report CO101RD1, "Accrual Funding of Military Retirement Health Care: FY94 Funding Estimates," January 1992, Melvin R. Etheridge, Jr.

**Category:** II.B

**Keywords:** Government, Budgeting, Manpower/Personnel, Labor, Overhead/Indirect, Variable Costs, Data Collection, Time Series, Study

**Title:** Analysis of Institutional Training Resources

**Summary:** Develop analytical tools for the analysis of resources in the institutional training base. Conduct research into methods by which the Military Services plan, program and budget resources. Develop methodologies for predicting future training loads, workloads and resources as a means of independent analysis. [This task appeared in the 1994 catalog as LMI-1.]

**Classification:** Secret

**Sponsor:** OUSD (Personnel and Readiness) (Readiness and Training)  
Room 3B930, The Pentagon  
Mr. Bob Howlett (703) 695-6857

**Performer:** Logistics Management Institute  
6400 Goldsboro Road  
Bethesda, MD 20817  
Mr. Walt Cooper (703) 917-7242

**Resources:** Dollars:  
Staff-years: 2.5 man-years annually

**Schedule:** Start: July 1992  
End: March 1995

**Data Base:** No new data bases are being developed. Tools work with several existing data bases, including training load and workload files furnished by the Defense Manpower Data Center, the Future Years Defense Program, and other data bases containing information on end strengths by grade, accessions, and unit costs. Automation uses standard off-the-shelf applications such as Fox Pro and Visual Basic.

**Publications:** TBD

**Category:** II.C

**Keywords:** Government, Estimating, Analysis, Programming, Budgeting, Forces, Infrastructure, Manpower/Personnel, Operations and Support, Fixed Costs, Variable Costs, Training, Data Collection, Mathematical Modeling, Statistics/Regression, Computer Model

**Title:** Training Installation Capability Analysis

**Summary:** Assesses the capacity of the training base to respond to training requirements associated with reconstitution. Involves analysis of each training category base-by-base, with capacities determined by considering such variables as billeting space, classrooms and other facilities, ranges, training manpower, and training equipment.

**Classification:** Unclassified

**Sponsor:** OUSD (Personnel and Readiness) (Readiness and Training)  
Room 3B930, The Pentagon  
Dr. Jim Berry

**Performer:** Logistics Management Institute  
6400 Goldsboro Road  
Bethesda, MD 20817  
Mr. Walt Cooper (703) 917-7242

**Resources:** Dollars:  
Staff-years: 2.0 man-years annually

**Schedule:** Start: May 1993  
End: May 1996

**Data Base:** This project is working with a number of data bases to conduct necessary assessments. No new data bases are being created.

**Publications:** LMI Report PR401RD1, Analysis of Training Installations — A System, April 1995, Walter Cooper, William Esmann, Melvin Etheridge

**Category:**

**Keywords:** Government, Analysis, Infrastructure, Facilities, Manpower/  
Personnel, Operations and Support, Training, Data Collection,  
Mathematical Modeling, Computer Model, Environment,  
Readiness

**Title:** Aircraft Operating and Support Cost-Estimating Relationships

**Summary:** Develop parametric methodologies for estimating the operating and support (O&S) costs of future weapon systems. The planned deliverables include a "bridge" between three-level and two-level maintenance costs and a set of cost estimating relationships (CERs) that relate weapons system characteristics with the level of financial resources in specific logistics support categories (e.g., depot level reparable, on-equipment aircraft depot maintenance, jet engine overhaul, sustaining engineering) required to operate a new weapon system. These CERs will be used by the Air Force Cost Analysis Agency to prepare the Air Force's independent cost analysis of new weapon system acquisition programs required at each Defense Acquisition Board milestone decision.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency  
Crystal Gateway North, Suite 403  
1111 Jefferson Davis Highway  
Arlington, VA 22202  
Col. Gordon D. Kage, II

**Performer:** Logistics Management Institute  
6400 Goldsboro Road  
Bethesda, MD 20817  
Mr. John Wallace (703) 917-7239

**Resources:** Dollars:  
Staff-years: 1.4 man-years

**Schedule:** Start: March 1994  
End: August 1995

**Data Base:** This task will produce a complete data base on two-level maintenance items for selected aircraft.

**Publications:** LMI Report AF403RD1, Estimating the Surcharge Component of the Depot-Level Reparables Funding Requirement for New Aircraft, April 1995.

**Category:** II.A.2

**Keywords:** Government, Estimating, Weapon Systems, Aircraft,  
Spares/Logistics, Operations and Support, Life Cycle,  
Sustainability, Data Collection, Data Base, Mathematical Model

**THE AEROSPACE CORPORATION**

<b><i>Name</i></b>	Resource Analysis Department, The Aerospace Corporation
<b><i>Address</i></b>	2350 E. El Segundo Boulevard El Segundo, CA 90245  Mail Station M4/021 P.O. Box 92957 Los Angeles, CA 90009-2957
<b><i>Director</i></b>	Dr. Stephen A. Book (310) 336-8655 FAX (310) 336-6914
<b><i>Size</i></b>	Professional: 13 Support: 1 Consultants: 1,000 Aerospace Corporation Engineers Subcontractors: 0
<b><i>Focus</i></b>	Space-system cost modeling, cost-risk analysis, schedule-risk analysis, statistical analysis
<b><i>Activity</i></b>	Number of projects in progress: 12 Average duration of a project: 1 year Average number of staff members assigned to a project: 1-2 Average number of MTS-years expended on a project: 0.5 Percent of effort conducted by consultants: 20% <div style="text-align: right;">(Aerospace Corp. Engineers)</div> Percent of effort conducted by subcontractors: 0%



**Title:** Costs of Space, Launch, and Ground Systems

**Summary:** Historical costs of space, launch, and ground systems, including vehicles, payloads, launch processing, delays, failures, etc. [This task appeared in the 1994 catalog as Aerospace-1.]

**Classification:** Unclassified; Government-only, Contractor-Proprietary Data

**Sponsor:** The Aerospace Corporation's Research Program and C.L. Whitehair, VP Space Launch Operations

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
S. A. Book (310) 336-8655  
E. L. Burgess (310) 336-4148

**Resources:** Dollars: \$80,000 FY95  
Staff-years: .5 FY95

**Schedule:** Start: Ongoing updates since 1987  
End:

**Data Base:** Contractor-Proprietary

**Publications:** "Costs of Space and Launch Systems," Aerospace Corporation Briefing ("The Whitehair Study"), August 1992

**Category:** II.A

**Keywords:** Government, Policy, Space Systems, Life Cycle, Acquisition Strategy, Data Collection, Case Studies, Data Base, Study

**Title:** Validation Testing of Commercial Risk-Analysis Software

**Summary:** Government validation testing of commercial risk-analysis software products is an ongoing research effort. Some test cases investigate handling of simple, routine tasks, others "push the envelope" of their limitations and advertising. Currently being tested is "Risk+," a third-party add-on to Microsoft Project to allow schedule risk analysis to be done inside Microsoft Project. The developer is Program Management Solutions, Inc., 553 N. Pacific Coast Hwy, Suite B-177, Redondo Beach, CA 90278, (310) 374-0455. Also being testing is RISK Version 2.2 developed by Tecolote Research, Inc. Deficiencies are specifically noted in controlled-access validation testing reports delivered to SMC/FMC locally for forwarding to AFCAA and SAF/FM. Explanations of deficiencies may be passed on to developers by AF personnel at their option. [This task appeared in the 1994 catalog as Aerospace-6.]

**Classification:** Unclassified

**Sponsor:** AF Space and Missile Systems Center/FMC acting also on behalf of Air Force Cost Analysis Agency (AFCAA) and office of Secretary of the Air Force/Financial Management (SAF/FM).

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957

S.A. Book	(310) 336-8655
O.F. Blackshire	(310) 336-7983
H.S. Gobreial	(310) 336-6420

**Resources:** Dollars: \$20,000  
Staff-years: 0.10

**Schedule:** Start: October 1994  
End: April 1995

**Data Base:** Recent historical costs and technical parameters of new generation of small satellites and launch vehicles.

- Publications:***
1. Book, S.A., and P.H. Young, "Validation Report on PLAN<sup>TM</sup> Risk Modeling Software," The Aerospace Corporation, 66 pages, 8 April 1992. (U.S. Government only).
  2. Book, S.A. and E.L. Burgess, "Validation Report on CRYSTAL BALL Risk Modeling Software," The Aerospace Corporation, 74 pages, 5 January 1993. (U.S. Government only).
  3. Book, S.A., Chunduri, N.R., and P.H. Young, "Validation Report on RI\$K Risk Modeling Software," The Aerospace Corporation, 58 pages, 19 March 1993. (U.S. Government only).
  4. Book, S.A., Chunduri, N.R., and P.H. Young, "Validation Report on @RISK Risk Modeling Software," The Aerospace Corporation, 78 pages, 6 April 1993. (U.S. Government only).
- Category:*** II.D
- Keywords:*** Government, Estimating, Analysis, Budgeting, Life Cycle, Acquisition Strategy, Schedule, Risk/Uncertainty, Mathematical Model, Computer Model

**Title:** Space Acquisition Strategy Model

**Summary:** Historical and current costs of civil and commercial systems. Determine if civil and commercial acquisition strategies can be adapted with resultant cost savings to the DoD procurement environment.

**Classification:** Unclassified

**Sponsor:** Aerospace Corporation Research Program

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
P. L. Smith (310) 336-4395  
D. C. Rudolph (310) 336-1185

**Resources:** Dollars: \$20,000  
Staff-years: 0.12

**Schedule:** Start: October 1994  
End: January 1995

**Data Base:** Space Systems Historical Experience

**Publications:** Lotus 1-2-3 spreadsheet, no graphics. Will run on any Lotus 1-2-3 compatible spreadsheet including Excel, Wingz, and Quattro Pro

**Category:** II.A.2, II.B

**Keywords:** Government, Analysis, Space Systems, Concept Development, Acquisition Strategy, Mathematical Modeling, Computer Model

**Title:** Small-Satellite Cost Engineering Model

**Summary:** Integration of physical, engineering, and cost relationships, encompassing new generation of low-weight, single-purpose, short-lifetime tactical satellites. Goal is to allow analyst to investigate in real time cost impacts of performance changes.

**Classification:** Unclassified; Government-only, Contractor-proprietary Data

**Sponsor:** AF Space and Missile Systems Center, NASA Lewis Research Center, NASA Jet Propulsion Laboratory.

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957

D.A. Bearden (310) 336-5852  
K.D. Bell (310) 336-2451  
E.L. Burgess (310) 336-4148

**Resources:** Dollars: \$160,000  
Staff-years: 1.0

**Schedule:** Start: January 1994  
End: None. (Maintenance ongoing)

**Data Base:** Recent historical costs and technical parameters of new generation of small satellites and launch vehicles.

**Publications:** 1. "Small-Satellite Cost Study," publicly releasable briefing containing no proprietary information, by D.A. Bearden, E.L. Burgess, and N.Y. Lao.  
2. "Cost-Effective Concept Definition Using an Integrated Cost Engineering Model Process," by K.D. Bell, A.B. Dawdy, and L.A. Hsu.

**Category:** I.A., II.A.1, II.D

**Keywords:** Government, Estimating, Space Systems, Production, Engineering, Manufacturing, Data Collection, Statistics/Regression, Data Base, Computer Model, CER

**Title:** Small-Satellite Cost Study

**Summary:** Data gathering and CER development, encompassing new generation of low-weight, single-purpose, short-lifetime tactical satellites. Implemented in test-and-evaluation version of computer model.

**Classification:** Unclassified; Government-only, Contractor-proprietary Data

**Sponsor:** AF Space and Missile Systems Center, Canada Department of National Defence, NASA Lewis Research Center.

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957

D.A. Bearden (310) 336-5852  
E.L. Burgess (310) 336-4148  
N.Y. Lao (310) 336-7876

**Resources:** Dollars: \$180,000 annually  
Staff-years: 1.10 annually

**Schedule:** Start: January 1991  
End: None. (Maintenance and upgrades ongoing)

**Data Base:** Recent historical costs and technical parameters of new generation of small satellites and launch vehicles.

**Publications:** "Small-Satellite Cost Study," publicly releasable briefing containing no proprietary information

**Category:** II.A., II.A.1, II.D

**Keywords:** Government, Estimating, Space Systems, Production, Engineering, Manufacturing, Data Collection, Statistics/Regression, Data Base, Computer Model, CER

**Title:** Costs and Benefits of Adherence to MIL-SPECs and MIL-STDs

**Summary:** Contractor requirements to adhere to MIL-SPECs and MIL-STDs increase program costs. The question that has to be answered is, do these requirements lead to improved reliability that eventually pays off.

**Classification:** Unclassified; Contractor-Proprietary Data

**Sponsor:** AF Space and Missile Systems Center, The Aerospace Corporation's Research Program.

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957

R.H. Lucas (310) 336-7786  
S.E. Jones (310) 336-8576

**Resources:** Dollars: \$80,000 FY95  
Staff-years: 0.5 FY95

**Schedule:** Start: October 1994  
End: September 1995

**Data Base:** Testing costs, other related data.

**Publications:** None as yet.

**Category:** I.A

**Keywords:** Government, Policy, Life Cycle, Acquisition Strategy, Risk/Uncertainty, Data Collection, Case Study, Study

**Title:** Reducing the Impact of Learning-Curve Assumptions

**Summary:** A 5% error in learning rate impacts life-cycle cost much more than a comparable error in system design characteristics. Investigate methods for reducing the impact of errors in learning-rate assumptions on production-cost estimates

**Classification:** Unclassified, Contractor-proprietary Data. Unclassified

**Sponsor:** The Aerospace Corporation's Engineering Methods Research Program

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
S.A. Book (310) 336-8655  
E.L. Burgess (310) 336-4148

**Resources:** Dollars: \$20,000 FY95  
Staff-years: 0.15 FY95

**Schedule:** Start: January 1995  
End: April 1995

**Data Base:** None

**Publications:** "The Learning Rate's Overpowering Impact on Cost Estimates and How to Diminish It," by S.A. Book and E.L. Burgess

**Category:** I.B.2, II.B, II.C, II.D

**Keywords:** Estimating, Production, Mathematical Modeling, Method, Cost Progress Curve



**Title:** Ground Systems Cost Model

**Summary:** Model costs of ground systems hardware, software, operations and maintenance. Derive CERs from historical data when available. Include satellite control, communication, launch processing, and security.

**Classification:** Unclassified, some Contractor-proprietary Data.

**Sponsor:** AF Space and Missile Systems Center

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957

A.J. Matthews (310) 336-1150  
L.B. Sidor (310) 336-1571  
L.G. Long (310) 336-4147

**Resources:** Dollars: \$200,000 FY95  
Staff-years: 1.2 FY95

**Schedule:** Start: October 1994  
End: September 1995

**Data Base:** Cost and technical data

**Publications:**

**Category:** II.A, II.C

**Keywords:** Government, Estimating, Budgeting, Facilities, Manpower/Personnel, Life Cycle, Data Collection, Statistics/Regression, Computer Model

**Title:** Concurrent Engineering as a Cost Reduction Method

**Summary:** This project focuses on potential for cost reduction in DoD space systems using concurrent engineering (CE) techniques. An extensive review of CE and product development literature was conducted. Factors leading to reported successes are being analyzed in relationship to the unique products (space systems) and acquisition environment of DOD programs. Pitfalls and impediments to implementing CE within the DOD space community are being considered. Finally, CE assessment techniques and potential cost impacts are to be investigated.

**Classification:** Unclassified, U.S. Government agencies and their contractors only

**Sponsor:** AF Space and Missile Systems Center

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
N. E. King (310) 336-8242

**Resources:** Dollars: \$25,000  
Staff-years: 0.15

**Schedule:** Start: FY 95  
End: Phase II started in FY 95

**Data Base:** Findings in public domain through 1993

**Publications:** "Identification of Factors for Assessing Concurrent Engineering as a Cost Reduction Method", Aerospace Report No. TOR-95(6512-01)-1, by N.E. King

**Category:** I.A, I.B

**Keywords:** Industry, Estimating, Space Systems, Demonstration/Validation, EMD, Production, Overhead/Indirect, Manufacturing, Acquisition Strategy, Case Study

**Title:** Impact of Programmatic on System Costs

**Summary:** Programmatic costs are rarely considered in the early stages of a project. Reasons for overlooking these factors include a perception that these are non-technical issues, lack of in-depth understanding of manufacturing processes, and limited availability of data (e.g., parametric models are based on "average" programmatic conditions). Previous studies show that programmatic factors such as acquisition strategy, production rates, and funding approaches have an impact upwards of 20% on unit costs. Cost guidelines and theory for modeling the impact of programmatic factors on life-cycle costs would augment current systems definition and cost estimating practices. An understanding of the linkage (relationship) of program cost to programmatic factors would allow these parameters to be traded and evaluated in the same manner as technical parameters.

**Classification:** Unclassified, U.S. Government agencies and their contractors only

**Sponsor:** AF Space and Missile Systems Center

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
C.D. Billingsley (310) 336-1589  
E.L. Burgess (310) 336-4148  
N.E. King (310) 336-8242

**Resources:** Proposed - 0.5 MTS

**Schedule:** TBD

**Data Base:** None

**Publications:** "ALARM CEM Module Upgrades Manufacturing & Programmatics - Task Definition", December 1994 briefing by N.E. King

**Category:** I.A, I.B, II.B

**Keywords:** Government, Estimating, Space Systems, Concept Development, EMD, Acquisition Strategy, Production Rate, Cost/Production Function, Method

**Title:** Bus Standardization Cost Model

**Summary:** The Standard Payload Interface Specification (SPIS) Study investigated impact on total mission costs of payload-bus standardization for Pegasus XL class space vehicles. Four bus architectures were defined for inputs to a parametric cost analysis. These architectures include reoptimizing a bus for each mission, fitting a standard bus with pre-qualified modules to meet a given mission requirement, purchasing a single-contractor standardized bus directly from the manufacturer that envelopes all requirements found in the mission model, and purchasing a multiple-contractor version of the latter. A top-down parametric tool to analyze sensitivities of key cost parameters for the four architectures was developed. Preliminary results indicate that a cost benefit can be gained by utilizing a standard payload interface on a robust standard bus if a sufficient number of flights are flown. The optimistic breakeven point for a single type of payload or mission is estimated at three missions, while under more conservative assumptions, breakeven occurs at eight missions. A realistic case that considers the wide range of payloads and mission types likely to be encountered in practice breaks even at thirteen missions. These conclusions are applicable to this class of space vehicles in the mid-1990s business environment.

**Classification:** U.S. Government agencies and their contractors

**Sponsor:** AF Space and Missile Systems Center (Phillips Lab).

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
N. E. King (310) 336-8242

**Resources:** Dollars: \$35,000  
Staff-years: 0.02

**Schedule:** 4th Quarter FY1994

**Data Base:** None

**Publications:** "A Parametric Cost Model for Analyzing Bus Standardization Issues", Aerospace Report No. TOR-95(5514)-1, September 1994, by N.E. King

**Category:** I.A, I.B, II.D

**Keywords:** Government, Analysis, Space Systems, EMD, Production,  
Acquisition Strategy, Manufacturing, Modification,  
Cost/Production Function, Method

**Title:** Aerospace Cost Analysis Model for Electronic Boxes

**Summary:** Models costs of theoretical first-unit production of electronic boxes that are utilized for advanced communication applications. Simplification and improvement of Tecolote Research's Microwave and Digital Cost Analysis Model (MADCAM).

**Classification:** Unclassified

**Sponsor:** AF Space and Missile Systems Center

**Performer:** The Aerospace Corporation  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
H.S. Gobreial (310) 336-6420

**Resources:** Dollars: \$80,000  
Staff-years: 0.5

**Schedule:** Start: January 1994  
End: August 1994

**Data Base:** Cost and technical data

**Publications:** "Simplification of Microwave and Digital Cost Analysis Model," DoD Cost Analysis Symposium, 22 September 1994, by H.S. Gobreial

**Category:** II.A.2, II.B

**Keywords:** Government, Estimating, Space Systems, Production, Data Collection, Statistics Regression, Mathematical Modeling, CER

**AIR FORCE INSTITUTE OF TECHNOLOGY**

<b><i>Name</i></b>	Graduate School of Logistics and Acquisition Management Air Force Institute of Technology		
<b><i>Address</i></b>	Department of Acquisition Management AFIT/LAS 2950 P Street (Bldg 641) Wright-Patterson AFB, OH 45433-7765		
<b><i>Director</i></b>	Dr. Roland D. Kankey	(513) 255-7777, x3382	
<b><i>Size</i></b>	Professional:	40	
	Support:	4	
	Consultants:		
	Subcontractors:		
<b><i>Focus</i></b>	The School research focus is on logistics and acquisition issues, to include cost analysis, cost management, contracting, and acquisition management. Items reported here are a combination of faculty research and thesis research projects worked as an integral part of the academic program leading to Master of Science degrees.		
<b><i>Activity</i></b>	Number of projects in progress:	generally 5-10	
	Typical duration of a project:	15 months	
	Typical number of staff members assigned to a project:		
	Typical number of staff-years expended per project:		
	Percent of effort conducted by consultants		%
	Percent of effort conducted by subcontractors		%



**Title:** Expanding the Defense Construction Supply Center (DCSC) Activity-Based Costing (ABC) Model to Include External Resource Costs

**Summary:** The research expands the ABC model developed by DCSC. The current model does not include reimbursable depot costs, stock fund, charges from DISA and DFAS, or DLA overhead. The model also does not assign activity costs to the commodity groups or weapon systems supported by DCSC. The research will trace these resource costs to the activities performed and commodities managed by DCSC. The resulting model will provide an ABC analysis of the entire DCSC supply chain.

**Classification:** Unclassified

**Sponsor:** Defense Construction Supply Center, RADM E.A. Elliott, Commander. Point of contact: Ms Betty Baker, 3990 East Broad Street, Columbus, OH 43216-5000, DSN 850-1881

**Performer:** Air Force Institute of Technology, Major Terrance L. Pohlen, PhD., AFIT/LAL, 2950 P Street, WPAFB OH 45433-7765, DSN 785-7777 extension 3327

**Resources:** No additional resources required.

**Schedule:** Start: 13 April 1995  
End: December 1995

**Data Base:** Research will produce a spreadsheet analysis of internal DCSC resources, external resources, activity costs, and tracing of activity costs to managed commodity groups

**Publications:** None

**Category:** II.A.2, II.B, II.C, II.D

**Keywords:** Government, Analysis, Spares/Logistics, Overhead/Indirect, Mathematical Modeling, Mathematical Model

**Title:** Development of an Activity-Based Costing (ABC) Model for the Defense Distribution Depot Columbus (DDCO)

**Summary:** The research will perform an activity-based costing (ABC) analysis of the depot operations performed at the Defense Logistics Agency (DLA) depot located at Columbus, OH. The analysis will initially trace depot resources to the logistics activities performed at the depot and subsequently trace the depot's activity costs to the supported inventory control points. The research will support follow-on reengineering analysis and the effects of provided tailored logistics services.

**Classification:** Unclassified

**Sponsor:** Defense Distribution Depot Columbus. Mr. Don Brown, DDCO-TM, DSN 850-3295. 3990 East Broad Street, Columbus, OH 43216-5000

**Performer:** Air Force Institute of Technology, Major Terrance L. Pohlen, PhD., AFIT/LAL, 2950 P Street, WPAFB OH 45433-7765, DSN 785-7777 extension 3327

**Resources:** No additional resources required

**Schedule:** Start: January 1995  
End: September 1995

**Data Base:** Research will produce a spreadsheet analysis of internal DDCO resources, depot activity costs, and tracing of activity costs to DLA inventory control points.

**Publications:** None

**Category:** II.A.2, II.B, II.C, II.D

**Keywords:** Government, Analysis, Spares/Logistics, Overhead/Indirect, Study

- Title:** Understanding the Implications of Activity-Based Costing for Logistics Management
- Summary:** The research developed a diagnostic activity-based costing (ABC) model for a major consumer products firm's distribution center. The model analyzed how logistics decision-making would effect changes in distribution center costs. The research also demonstrated the utility of ABC in a logistics environment. Research represented a joint military-business effort supported by the Air Force Institute of Technology, The Ohio State University, Arizona State University, University of Cincinnati, Andersen Consulting, and a major consumer products firm.
- Classification:** Unclassified. Portions of the research database are proprietary and business sensitive.
- Sponsor:** Professor Bernard J. LaLonde, Max M. Fisher College of Business, The Ohio State University, 1775 College Road, Columbus, OH 43210-1399. (614) 292-0331.
- Performer:** Air Force Institute of Technology, Major Terrance L. Pohlen, PhD., AFIT/LAL, 2950 P Street, WPAFB OH 45433-7765, DSN 785-7777 extension 3327
- Resources:** No additional resources required
- Schedule:** Start: April 1994  
End: December 1994
- Data Base:** Research produced a spreadsheet analysis of the activity costs performed at one of the firm's distribution centers. The spreadsheet traces resource costs to the activities performed by the distribution center and to the firm's product divisions.
- Publications:** Final report TBD. Interim report included in Pohlen, Terrance L., *et al.*, "Understanding the Implications of Activity-Based Costing for Logistics Management," *Annual Conference Proceedings of the Council of Logistics Management*, October 16-19, 1994.
- Category:** II.A.2, II.B, II.C, II.D
- Keywords:** Industry, Analysis, Spares/Logistics, Overhead/Indirect, Mathematical Modeling, Mathematical Model

- Title:** Applicability of an Activity-Based Cost System Within Government Service Organizations
- Summary:** The research focused on the applicability of activity-based costing within a government service organization. A case study analysis of the Air Force Institute of Technology was used to develop a methodology for employing ABC within a government organization. The resulting ABC system reported activity costs, process costs, and costs by educational program. The research concluded ABC can offer government organizations with activity-based and non-budgetary information which may be used to target opportunities for process improvement or cost reduction.
- Classification:** Unclassified
- Sponsor:** Air Force Institute of Technology, Major Terrance L. Pohlen, PhD., AFIT/LAL, 2950 P Street, WPAFB OH 45433-7765, DSN 785-7777 extension 3327
- Performer:** Captain Robert W. Callahan and Captain Daniel Marion, graduate students, Air Force Institute of Technology.
- Resources:** No additional resources required.
- Schedule:** Start: May 1993  
End: August 1994
- Data Base:** Research produced an activity-based spreadsheet analysis of AFIT resources, activity and process costs, and tracing of activity costs to educational departments and programs.
- Publications:** Callahan, Robert W. and Daniel A. Marion, "Applicability of an Activity-Based Cost System Within Government Organizations," AFIT/GLM/LAL/94S-4, unpublished masters thesis, August 1994.  
  
Callahan, Robert W., Daniel A. Marion, and Terrance L. Pohlen, "Activity Based Costing: Accounting Information to Measure, Manage, and Improve Activities and Processes," *Air Force Journal of Logistics*, Vol 18, No 4, Fall 1994, pp. 41.
- Category:** II.A.2, II.B, II.C, II.D
- Keywords:** Government, Analysis, Spares/Logistics, Overhead/Indirect, Case Study, Study

**Title:** The Purpose and Development of a Management Reserve Budget on Defense Contracts

**Summary:** This study documents the purposes and development of a Management Reserve Budget by a review of system descriptions prepared by C/SCSC-compliant defense contractors and by interview of government and contractor experts

**Classification:** None

**Sponsor:** OUSD(A) API/PM, 23020 Defense Pentagon, Room 3E1025, Washington, DC 20301-3020

**Performer:** Kevin Gould advised by Dr. David Christensen at the Air Force Institute of Technology (255-7777, ext 3375)

**Resources:** None

**Schedule:** Start: June 1994  
End: August 1995

**Data Base:** System Descriptions

**Publications:** Thesis available from Defense Technical Information Center in 1995

**Category:** I.D

**Keywords:** Government, Estimating, Weapon Systems, EMD, Manufacturing, Data Collection, Study

**Title:** A Comparison of Nonlinear Estimate At Completion Methods

**Summary:** This study compares the accuracy of selected nonlinear formulas for estimating the final cost of a defense contract.

**Classification:** None

**Sponsor:** OUSD(A) API/PM, 23020 Defense Pentagon, Room 3E1025, Washington, DC 20301-3020

**Performer:** Todd Nystrom advised by Dr. David Christensen at the Air Force Institute of Technology (255-7777, ext 3375)

**Resources:** None

**Schedule:** Start: June 1994  
End: August 1995

**Data Base:** Defense Acquisition Executive Summary Database

**Publications:** Thesis available from Defense Technical Information Center in 1995

**Category:** I.B

**Keywords:** Government, Estimating, Weapon Systems, EMD, Manufacturing, Data Collection, Study

**Title:** An Analysis of Smart Bomb Alternatives Using the Analytic Hierarchy Process

**Summary:** This study is an economic analysis of smart bomb interface options on fighter aircraft. Quantitative and qualitative evaluation criteria are considered using a multi-criteria decision model, the Analytic Hierarchy Process.

**Classification:** None

**Sponsor:**

**Performer:** David King advised by Dr. David Christensen at the Air Force Institute of Technology (255-7777, ext 3375)

**Resources:** None

**Schedule:** Start: June 1994  
End: August 1995

**Data Base:** Expert Opinion

**Publications:** Thesis available from Defense Technical Information Center in 1995

**Category:** I.A.1

**Keywords:** Government, Analysis, Airframe, Concept Development, Acquisition Strategy, Economic Analysis, Computer Model

**Title:** Hazardous Materials Life Cycle Estimation

**Summary:** This study explores ways to more effectively use an established model for estimating the cost of hazardous waste, the HAZMAT model, developed by The Analytic Sciences Corporation. The focus of the study is to develop parametrics that would allow the model to be used earlier in a project's design process.

**Classification:** None

**Sponsor:**

**Performer:** Mark Garner and Jennifer Kirchhoffer advised by Dr. David Christensen at the Air Force Institute of Technology (255-7777, ext 3375)

**Resources:** None

**Schedule:** Start: June 1994  
End: August 1995

**Data Base:** HAZMAT Database

**Publications:** Thesis available from Defense Technical Information Center in 1995.

**Category:** I.C

**Keywords:** Government, Estimating, Weapon Systems, Life Cycle, Environment, Computer Model



**Title:** An Analysis of Self-care at WPAFB Hospital

**Summary:** Self-care education has been shown to reduce unnecessary use of civilian health care services. This study examines the potential of self-care education to reduce the use of unnecessary outpatient visits at a military hospital.

**Classification:** None

**Sponsor:** HQ AFMC/SG and WPMC/SG (Wright-Patterson AFB)

**Performer:** Chris Svehlak advised by Dr. David Christensen at the Air Force Institute of Technology (255-7777, ext 3375)

**Resources:** Dollars: \$65,000  
Staff-years:

**Schedule:** Start: June 1994  
End: August 1995

**Data Base:** Consolidated Health Care System at WPMC/SG

**Publications:** Thesis available from Defense Technical Information Center in 1995

**Category:** II.C

**Keywords:** Government, Analysis, Manpower/Personnel, Operations and Support, Training, Data Collection, Study

**Title:** Calibration of Five Software Cost Models to an Air Force Data Base ("Project Pentateuch")

**Summary:** Five popular software cost estimation models (PRICE-S, SEER-SEM, SLIM, REVIC, and SASET) are being calibrated to a large Air Force software cost database managed by Air Force's Space and Missiles Center (SMC). The effort involves calibration to various subsets of the database such as unmanned space programs and avionics programs, and validation of models with projects in each subset not used in calibration.

**Classification:** Unclassified

**Sponsor:** SMC/FMC (Gina Novak-Ley)  
MCR, Inc. (Sherry Stukes)

**Performer:** Five AFIT Thesis students: Capt James Galonsky, Capt Robert Kressin, Capt Kolin Rathmann, Lt Carl Vegas, and Mrs. Betty Weber (each responsible for a thesis); advised by Prof Dan Ferens of AFIT/LAS

**Resources:** Dollars:  
Staff-years:

**Schedule:** Start: September 1994  
End: August 1995

**Data Base:** The SMC Software Database (SWDB) of over 2,400 programs

**Publications:** The five theses will be available from Defense Technical Information Center in January, 1996

**Category:** II.A.1, II.D

**Keywords:** Government, Analysis, Estimating, EMD, Life Cycle, Labor, Data Collection, Statistics/Regression, Study, Computer Model

**DEFENSE SYSTEMS MANAGEMENT COLLEGE**

<b><i>Name</i></b>	Financial Management Department		
<b><i>Address</i></b>	Defense Systems Management College Fort Belvoir, VA 22060		
<b><i>Director</i></b>	Lt. Col. Cleve Pillifant	(703) 805-4431	
	Mr. Bernard Rudwick	(703) 805-3783	
<b><i>Size</i></b>	Professional:	11	
	Support:	2	
	Consultants:	0	
	Subcontractors:	0	
<b><i>Focus</i></b>	Cost Analysis, Budget Process, Funds Management		
<b><i>Activity</i></b>	Number of projects in progress:	12	
	Typical duration of a project:	3 months	
	Typical number of staff members assigned to a project:	1-2	
	Typical number of staff-years expended per project:	.1	
	Percent of effort conducted by consultants	0%	
	Percent of effort conducted by subcontractors	1%	

**Title:** Cost and Risk Analysis Research

**Summary:** The objective of this applied research effort is two-fold. The first part seeks to develop a more effective strategy for analyzing, managing, and controlling risk (particularly cost overruns) within developmental contracts. This research centers on applying an integrated approach to program management—an approach which coordinates the four key elements of technical performance measurement, cost control, schedule control, and risk management. This method helps maintain active channels of communication between contractor and client, and assists in the overall management of the program. Past effort in this area has focused on the Airborne Low-Frequency Sonar Program of the SH-60F Seahawk helicopter as a pilot vehicle for validating the risk management process.

The second related part of this research effort has focused on developing methods for reducing the cost of development or production programs where affordability has been a major constraint. An example of this process was the effort in support of the recent C-17 Should Cost Study conducted by the USAF Materiel Command.

**Classification:** Unclassified

**Sponsor:** Defense Systems Management College  
Fort Belvoir, VA 22060

**Performer:** Defense Systems Management College  
Fort Belvoir, VA 22060  
Mr. Bernard Rudwick (703) 805-3783

**Resources:** Dollars:  
Staff-years:

**Schedule:** Start: 1995  
End: Continuing

**Data Base:**

***Publications:*** Internal memoranda only are available at the present time. These are in the process of being converted into an updated edition of the DSMC Guide on Risk Management.

***Category:*** II.B

***Keywords:*** Industry, Government, Estimating, Analysis, Reviewing/  
Monitoring, Helicopters, EMD, Risk/Uncertainty, Case Study,  
Economic Analysis, Expert System, Study

**Title:** Integrated Product Development (IPD) at the Air Force Materiel Command

**Summary:** The researchers have assisted the sponsor in coordinating and activating Integrated Product Development (IPD) to assure the smooth management of this facility. Under this effort, IPD will emphasize establishing control of the processes within the facility, and then developing strategies and techniques to improve the flow of communication within the organization, measure and increase efficiency, and measure and improve effectiveness.

**Classification:** Unclassified

**Sponsor:** Air Force Materiel Command  
Wright-Patterson Air Force Base  
Col. Greg Siegel (AFMC/XR)      DSN 787-7033

**Performer:** Defense Systems Management College  
Fort Belvoir, VA 22060  
Mr. Bernard Rudwick      (703) 805-3783

**Resources:** Dollars:  
Staff-years:

**Schedule:** Start: February 1993—Phase I has been completed. IPD  
Implementation Phase now underway.  
End: Indefinite

**Data Base:**

**Publications:** "Air Force Materiel Command Guide on Integrated Product Development," 25 May 1993

**Category:**

**Keywords:** Government, Analysis, Policy, Weapon Systems, Spares/Logistics, Life Cycle, Integration, Case Study, Study

**Title:** Research on Ongoing Acquisition Research (ROAR)

**Summary:** ROAR is an online system available to DoD and university researchers who currently conduct studies on acquisition-related topics such as cost modeling and pricing concerns, engineering and manufacturing practices, industrial base issues, logistics, contracting, commercial practices, acquisition workforce management, and education, etc. Access is available via the ROAR BBS (703-805-3981) and voice (703-271-5988) for those who contribute a description of their own *ongoing* study. Additionally, ROAR data will be accessible via the Internet in the 2nd half of CY 1995. Searches are performed automatically overnight and show each caller the closest matches to his/her project. ROAR tracks over 2,500 studies around the world.

**Classification:** Unclassified

**Sponsor:** Defense Systems Management College and  
Defense Acquisition University  
Fort Belvoir, VA 22060-5416  
Mr. James Abellera (703) 805-2525

**Performer:** DSMC faculty (see above)

**Resources:** Dollars:  
Staff-years:

**Schedule:** Start: 1989  
End: Continuing

**Data Base:** See summary above  
Automation: Multiple PCs

**Publications:** New search results are available electronically every week via the ROAR BBS for registered subscribers until their projects are completed.

**Category:**

**Keywords:** Industry, Government, Data Collection, Data Base



**CENTER FOR NAVAL ANALYSES**

**Title:** Study of Procedures and Software for Assessing Uncertainty in Cost Estimates

**Summary:** This is a study of selected analytical procedures and software packages associated with cost uncertainty analysis. The analytical questions have to do with (1) treatment of correlation among cost elements, (2) selection of specific probability distributions for characterizing uncertainty in different circumstances, and (3) generation of parameter values for the distributions. A set of software packages that support risk/uncertainty analysis is being evaluated, including one developed by the sponsor of the work.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
Mr. Robert E. Lee (703) 604-0302

**Performer:** The CNA Corporation  
Dr. Henry L. Eskew (703) 824-2254  
Dr. Walter R. Nunn (703) 824-2456

**Resources:** Dollars: FY 1995  
Staff-years: Core contract 0.3

**Schedule:** Start: September 1994  
End: June 1995

**Data Base:** Not applicable

**Publications:** CNA Research Memorandum 95-87, *Procedures and Software for Assessing Uncertainty in Cost Estimates* (forthcoming)

**Category:** II.A.2, II.B

**Keywords:** Government, Estimating, Analysis, Risk/Uncertainty, Statistics/Regression, Study

**Title:** Update and Extension of Automated Cost Models

**Summary:** This project involves updating and expanding two automated cost models developed earlier at CNA: (1) A model to estimate acquisition costs of tactical aircraft and (2) a model for projecting long-term fiscal requirements of the Department of the Navy. For the acquisition cost model, the major intent is to add the capability to estimate the costs of annual operations and support (O&S). For the fiscal requirements model, the plan is to convert the presently mainframe-based model to an electronic spreadsheet for use on a personal computer then to update the tables and algorithms based on current program and budget data.

**Classification:** Unclassified

**Sponsor:** CNA-initiated study  
Navy POC: Director, Assessment Division (N-81)

**Performer:** The CNA Corporation

Mr. Jino Choi (703) 824-2266  
Dr. Henry L. Eskew (703) 824-2254

**Resources:** Dollars: FY 1995  
Staff-years: Core contract 0.3  
Core contract 0.4

**Schedule:** Start: May 1995  
End: April 1996

**Data Base:** Not applicable

**Publications:** TBD

**Category:** II.A.2, II.B

**Keywords:** Government, Estimating, Programming, Aircraft, Forces, Life Cycle, Data Collection, Mathematical Modeling, Computer Model

**INSTITUTE FOR DEFENSE ANALYSES**

<b><i>Name</i></b>	Cost Analysis and Research Division, Institute for Defense Analyses		
<b><i>Address</i></b>	1801 N. Beauregard Street Alexandria, VA 22311		
<b><i>Director</i></b>	Dr. Stephen J. Balut	(703) 845-2527	
<b><i>Size</i></b>	Professional:	42	
	Support:	4	
	Consultants:	36	
	Subcontractors:	1	
<b><i>Focus</i></b>	Systems Costs, Force Costs, Preparedness Costs		
<b><i>Activity</i></b>	Number of projects in progress:	40	
	Typical duration of a project:	1 year	
	Typical number of staff members assigned to a project:	2-4	
	Typical number of staff-years expended per project:	2.0	
	Percent of effort conducted by consultants	30%	
	Percent of effort conducted by subcontractors	2%	

**Title:** Analytic Support to the Commission on Roles and Missions of the Armed Forces

**Summary:** This task supports the Commission in their review of the military mission definition. IDA is providing technical support on 20 of the 26 issues and cost support on all the issues. Cost support runs the gamut of simple use of existing models/data to full blown analyses requiring the development of new models involving data collection, manipulation and analysis.

**Classification:** Generally Unclassified with Secret annexes

**Sponsor:** The Commission on Roles and Missions of the Armed Forces  
Suite 1200F, 1100 Wilson Blvd.,  
Arlington, VA  
Capt. Gregory L. Shaw (703) 696-4250 ext. 35.

**Performer:** IDA  
1801 N. Beauregard Street, Alexandria, VA 22311  
Mr. Timothy J. Graves (703) 845-2339

<b>Resources:</b>	Dollars	Staff-Years
FY1994	\$4,541,000	27

**Schedule:** Start: July 1994  
End: May 1995

**Data Base:** FYDP  
Description: FYDP type data for all DoD programs to include Defense Mission Categories, Program Element  
Automation: PC in FoxPro, Excel, others

**Publications:** TBD

**Category:** I.A, I.B

**Keywords:** Government, Estimating, Forces, Weapon Systems, Infrastructure, Life Cycle, Fixed Costs, Variable Costs, Acquisition Strategy, Risk/Uncertainty, Readiness, Sustainability, Data Collection, Case Study, Cost/Production Function, Mathematical Modeling

**Title:** Integrated Schedule and Cost Model

**Summary:** Collect satellite and missile schedule and cost data including functional costs over time at the program level from contractor and government sources. Investigate schedule and functional cost relationships at major acquisition milestones. Develop analytical model that provides estimates of changes in costs associated with changes in schedules and vice versa for satellite and missile systems.

**Classification:** Proprietary Information

**Sponsor:** BMDO, Mr. James Dryden, Director, Cost Estimating and Analysis, Room 1E1037, The Pentagon, (703) 693-1813.

**Performer:** IDA

Mr. James Bui	(703) 845-2133
Mr. Bruce Harmon	(703) 845-2501

<b>Resources:</b>	Dollars	Staff-Years
FY 1993	\$300,000	
FY 1995	\$50,000	

**Schedule:** Start: January 1993  
End: December 1995

**Data Base:** Contractor-provided and CCDR functional cost over time data for selected space and missile systems. Program level functional RDT&E and production costs. Satellite and missile schedule information collected by IDA  
Automation: Excel Spreadsheets

**Publications:** TBD

**Category:** II.A

**Keywords:** Government, Industry, Estimating, Space Systems, Missiles, EMD, Production, Engineering, Manufacturing, WBS, Statistics/Regression, CER, Data Collection, Data Base, Mathematical Model, CCDR, Schedule

**Title:** Assessing Defense Funding Supporting Readiness

**Summary:** Maintaining the readiness of U.S. defense forces is one of the highest budgetary priorities of the Department of Defense. In order to do this, analysts and senior defense executives must be able to evaluate defense budgets and the FYDP to determine if they provide adequate funding for the desired level of readiness. A major portion of this research is identifying and quantifying the accounting changes that have occurred in DoD funding policies over the past two decades. The research also is developing a methodology for identifying the portions of the defense program that have the most impact on readiness and is developing alternative metrics that describe changes in defense force size.

**Classification:** Secret

**Sponsor:** Deputy Under Secretary of Defense (Readiness)  
Director for Readiness and Training  
Room 1C757, The Pentagon

Mr. Mike Kendall (703) 697-4992

**Performer:** IDA  
Mr. James L. Wilson (703) 845-2469

<b>Resources:</b>	Dollars	Staff-Years
FY 1995	\$300,000	1.9

**Schedule:** Start: October 1994  
End: September 1996

**Data Base:** FYDP Funding Adjustments (Pending)

**Publications:** TBD

**Category:** II.B, II.C

**Keywords:** Government, Analysis, Forces, Life Cycle, Readiness, Method, Study



**Title:** Cost of Defense Force Projections

**Summary:** Develop methodologies and capability to estimate the cost of projected defense forces, acquisition programs, and major support functions out to the year 2013. Following the projection, contribute to analyses of cost implications of alternative force and acquisition strategies. [This task appeared in the 1994 catalog as IDA-4.]

**Classification:** Secret

**Sponsor:** OUSD(A&T)(API)  
Program Assessment, Acquisition,  
Room 1E462, The Pentagon  
Washington, DC 20301

Dr. Royce Kneece (703) 697-1786

**Performer:** IDA

Mr. Timothy J. Graves (703) 845-2339

<b>Resources:</b>	Dollars	Staff-Years
FY 90	125,000	1
FY 91	125,000	1
FY 92	200,000	1.3
FY 93	250,000	2
FY 94	300,000	2.4
FY 95	75,000	.6

**Schedule:** Start: July 1990  
End: September 1996

**Data Base:** Defense Program Projection

Description: FYDP type data for all DoD programs to include  
Defense Mission Categories, Program Element,  
Procurement Annex Line Item

Automation: PC in dBASE, FoxPro

**Publications:** "The Defense Program Projection," T. J. Graves, pending,  
Unclassified

**Category:** II.A.1, II.A.2, II.B

**Keywords:** Government, Programming, Forces, Life Cycle, Acquisition Strategy, Mathematical Modeling, Computer Model

**Title:** Migration (Tree) Diagrams and Enterprise Integration Process Documentation Support

**Summary:** This task analyzes the migration process used for selecting migration candidates. From this analysis, a knowledgebase will be prepared for use with the prototype Process Management Tool. This development of the knowledgebase will be used to educate and assist functional managers in developing their migration strategies for legacy systems. These migration system will then be the identified in the Defense Integration Support Tools (DIST) as a part of the "Tree" diagrams for the affected functional area.

**Classification:** Unclassified

**Sponsor:** Defense Information Systems Agency (DISA), Directorate of Enterprise Integration, Skyline #1, Suite 810, Falls Church, VA  
Mr. Martin Gross (703) 845-2238

**Performer:** IDA

Mr. Paul Goree (703) 845-2238

<b>Resources:</b>	Dollars	Staff-Years
FY 95	200,000	1.3

**Schedule:** Start: March 1995  
End: March 1996

**Data Base:** DIST

Description: The DIST database will be accessed to help with the decision process.

Automation: PC using Microsoft Access and Visual Basic

**Publications:** TBD

**Category:** II.A.2, II.C.

**Keywords:** Government, Analysis, Infrastructure, Life Cycle, Automation, Integration, Case Study, Method, Computer Model

**Title:** Program Risk Analysis and Management

**Summary:** The objective of this task is to develop algorithms by which contractors may develop more reasonable risk margins for bidding on production contracts. In addition, the task will investigate mechanisms by which the government may review and monitor contractor risk estimates.

**Classification:** Unclassified

**Sponsor:** Under Secretary (Acquisition & Technology), Acquisition Program Integration

Mr. Wayne Abba (703) 695-5166

**Performer:** IDA

Dr. Matthew S. Goldberg (703) 845-2099

**Resources:**

	Dollars	Staff-Years
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FY 1995	\$700,000	4.0
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**Schedule:** Start: December 1994

End: May 1996

**Data Base:**

**Publications:** Final report due at end of project.

**Category:** I.B.2, I.D

**Keywords:** Industry, Government, Estimating, Reviewing/Monitoring, Budgeting, Production, WBS, Risk/Uncertainty, Acquisition Strategy, Mathematical Modeling, Data Base, Review, Method

**Title:** Space and Missile Systems Nuclear Hardening Costs

**Summary:** Investigate relationships between costs and technical characteristics, including nuclear-radiation hardening and other survivability features of selected military satellite and ground-based missile systems. Develop CERs to estimate the marginal costs to harden satellites and missiles against nuclear weapons effects. [This task appeared in the 1994 catalog as IDA-11.]

**Classification:** Secret-Restricted Data, Proprietary Information

**Sponsor:** DNA/TAIC  
6801 Telegraph Road  
Alexandria, VA  
Maj. Debra Richlin (703) 325-1218

**Performer:** IDA  
Mr. James Bui (703) 845-2133  
Mr. James Roth (703) 845-6973

**Resources:**

	Dollars:	Staff-years:
FY 1993	\$200,000	
FY 1994	\$275,000	

**Schedule:** Start: April 1993  
End: June 1996

**Data Base:** Satellite data includes Unmanned Space Vehicle Cost Model and data collected by IDA. Missile cost data from U.S. Army and Navy sources. Satellite and missile RDT&E and production costs segregated by subsystems. Satellite and missile technical data, including performance characteristics and nuclear-hardening specifications.

Automation: Excel spreadsheets

**Publications:** IDA P-2857, "Estimating the Costs of Nuclear-Radiation-Hardened Military Satellites," Secret/Resricted Dated, November 1994

**Category:** II.C

***Keywords:*** Government, Industry, Estimating, Space Systems, Missiles, EMD, Production, WBS, Statistic/Regression, CER, Data Collection, Data Base, Mathematical Model

**Title:** Technical and Schedule Risk Assessments for Tactical Aircraft Programs

**Summary:** This task supports Air Warfare/Strategic and Tactical Systems in providing independent program assessments of technical and schedule risks for tactical aircraft and missiles to the Conventional Systems Committee for DAB milestone reviews. This is a continuing project. [This task appeared in the 1994 catalog as IDA-13.]

**Classification:** Secret/Proprietary Information

**Sponsor:** USD(A&T)  
S&TS/AW  
Room 3E1081, The Pentagon  
Washington, DC 20301  
Mr. Gissendanner (703) 695-3015

**Performer:** IDA  
Dr. J. R. Nelson (703) 845-2571  
Dr. Bruce Harmon (703) 845-2501

**Resources:** Dollars: \$400,000  
Staff-years: 2.5

**Schedule:** Start: February 1992  
End: Continuing

**Data Base:** N/A

**Publications:** TBD

**Category:** I.B.2

**Keywords:** Government, Analysis, Aircraft, EMD, Production, Schedule, Data Collection, Data Base, Method

**Title:** Software Environments

**Summary:** The first objective of this task is to provide technical advice on open architecture issues. The second objective is to develop practical ways to model and measure the impact of STARS environments, tools, and processes on software productivity and quality. [This task appeared in the 1994 catalog as IDA-18.]

**Classification:** Unclassified

**Sponsor:** DARPA  
Suite 400  
801 N. Randolph St.  
Arlington, VA 22209  
Mr. John Foreman (703) 245-8655

**Performer:** IDA  
Dr. Thomas P. Frazier (703) 845-2132  
Dr. John Bailey (703) 385-8300  
Mr. Bruce N. Angier (703) 845-2513

<b>Resources:</b>	Dollars	Staff-Years
FY 91	370,000	2.5
FY 92	200,000	1.75
FY 93,	200,000	1.5
FY 94	145,000	1.25
FY 95	98,000	1.00

**Schedule:** Start: May 1990  
End: Continuing

**Data Base:** None

**Publications:** "A User's Guide for the Software Technology Economic Impact Model," IDA Document D-971, T. P. Frazier, B. Boehm, B. N. Angier, E. K. Bailey, P. M. Lurie, and K. L. Wilson, October 1991, Unclassified  
  
"The Economic Impact of STARS-Supported Technologies," IDA Document D-1093, T. P. Frazier, E. K. Bailey, B. N. Angier, and K. L. Wilson, January 1992, Unclassified

**Category:** II.A.2



***Keywords:*** Government, Analysis, EMD, Automation, Mathematical Modeling, Study, Computer Model

**Title:** Economics of Software Reuse Repositories

**Summary:** The objective of this project is to investigate the issues involved in constructing a fee-for-service charging scheme that could be employed by a software reuse repository. The product of this research will be a report that identifies a pricing scheme that will take into account economic factors that encourage the practice of reusing software and factors that encourage contributors to place reusable software components into the repository. [This task appeared in the 1994 catalog as IDA-20.]

**Classification:** Unclassified

**Sponsor:** Director of Defense Information  
Crystal Square #2, Suite 900  
Arlington, VA

Ms. Linda Brown (703) 746-7928

**Performer:** IDA

Dr. Thomas Frazier (703) 845-2132

Dr. Elizabeth Bailey (703) 385-8300

Mr. Bruce Angier (703) 845-2513

**Resources:** Dollars: \$70,000

Staff-years: .5

**Schedule:** Start: January 1993

End: February 1995

**Data Base:** N/A

**Publications:** "Economic Foundations for Pricing Software Reuse Repositories," IDA Paper P-2975, T. P. Frazier, E. K. Bailey, and B. N. Angier, Sept 1994.

**Category:** II.D

**Keywords:** Government, Policy, Economic Analysis, Study

**Title:** Estimating the ROI for Software System Engineering

**Summary:** This task seeks to estimate the economic benefits to the DoD from investments in software technologies.

**Classification:** Unclassified

**Sponsor:** Defense Information Systems Agency  
Software Systems Engineering Directorate  
Falls Church, VA 22042  
Dr. Alan Smith (703) 285-6589

**Performer:** IDA  
Dr. Thomas Frazier (703) 845-2132

**Resources:**

	Dollars	Staff-Years
FY 94	\$67,230	.5

**Schedule:** Start: July 1994  
End: On-going

**Data Base:** N/A

**Publications:** TBD

**Category:** I.A.1, II.A.2

**Keywords:** Government, Estimating, Infrastructure, Production, Engineering, Mathematical Modeling, Study

**Title:** Business Process Redesign

**Summary:** The objective of this project is to develop an integrated tool set designed to incorporate business redesign functions. The tool set will be composed of process modeling software, activity-based accounting models, and analytical models such as the Functional Economic Analysis Model. A prototype integrated model will be demonstrated in the spring of 1994. [This task appeared in the 1994 catalog as IDA-22.]

**Classification:** Unclassified

**Sponsor:** Director of Defense Information  
Crystal Square #2, Suite 900  
Arlington, VA

Mr. Mike Yeomans (703) 746-7932

**Performer:** IDA

Dr. Thomas Frazier (703) 845-2132

Mr. Alex Salerno (703) 845-2243

Mr. Charles Weber (703) 845-6784

<b>Resources:</b>	Dollars	Staff-Years
FY 93	150,000	1
FY 94	300,000	2

**Schedule:** Start: January 1993  
End: Continuing

**Data Base:** N/A

**Publications:** TBD

**Category:** II.A.2

**Keywords:** Government, Estimating, Infrastructure, Operations and Support, Automation, WBS, Mathematical Modeling, Method, Computer Model

**Title:** Resource Analysis for Test and Evaluation

**Summary:** Analysis of resources devoted to the Major Range and Test Facility Base to include operating cost, investment cost, and personnel resources. Analyses include cost comparisons of alternative approaches to developing test and evaluation capability and realigning workload within existing infrastructure. Evaluation will include identification of efficiencies in management, operations, and resource processing. [This task appeared in the 1994 catalog as IDA-23.]

**Classification:** Top Secret

**Sponsor:** Deputy Director, Defense Test and Evaluation (DT&E)  
Room 3D1067, The Pentagon  
Washington, DC 20301

Mr. John Bolino (703) 697-4818

**Performer:** IDA

Mr. Charles T. Ackerman (703) 578-2714

Mr. Dennis O. Madl (703) 578-2718

**Resources:** Dollars: \$1,900,000

Staff-years: 12

**Schedule:** Start: October 1994

End: April 1996

**Data Base:** T&E Resources

Description: Operating Cost, Investment Projects, Real Property

Automation: Hardcopy, floppies or hard disk

**Publications:** "Cost Comparison of the Navy's Air Combat Environment Test and Evaluation Facility (ACETEF) and the Air Force's Electronic Combat Integrated Test (ECIT)," IDA Paper 2727, K. M. Olver, C. T. Ackerman, J. J. Cloos, D. B. Levine, and D. O. Madl, June 1992, Unclassified

**Category:** I.B.2

***Keywords:*** Government, Analysis, Policy, Programming, Budgeting, Infrastructure, EMD, Test and Evaluation, Operations and Support, Acquisition Strategy, Labor, Overhead/Indirect, Economic Analysis, Study, Data Base

**Title:** Resource Analysis for Acquisition Systems Protection

**Summary:** Analyze deficiencies identified and progress in implementing the DoD Acquisition Systems Protection (ASP) Program, estimate resources required to correct deficiencies, and from this information contribute to the ASP Report to Congress, revisions to the ASP Master Plan, and ASP Information Management System. Study feasibility of security cost model. [This task appeared in the 1994 catalog as IDA-25.]

**Classification:** Secret

**Sponsor:** Acquisition Systems Protection Office  
Deputy Director, Security Program Integration  
Directorate of Counterintelligence and Security Programs,  
DASD(I&S))  
The Pentagon, Room 3C1281  
Washington, DC 20301  
  
Ms. Rene Davis-Harding (703) 697-2242

**Performer:** IDA  
  
Mr. Thomas Musson (703) 845-2729  
Ms. Christine Lange (703) 845-2728

<b>Resources:</b>	Dollars	Staff-Years
FY 1992	250,000	1.7
FY 1993	250,000	1.7
FY 1994	160,000	1.0
FY 1995	75,000	

**Schedule:** Start: January 1992  
End: January 1996

**Data Base:** None

**Publications:** TBD

**Category:** II.A.2, II.C

**Keywords:** Government, Analysis, Weapon Systems, Life Cycle, Security, Case Study, Mathematical Modeling, Review, Study

**Title:** Preplanned Product Improvements and Engineering Change  
Proposals for Consolidated Automated Support System (CASS)

**Summary:** Provides assessment of costs and benefits of preplanned product  
improvement options and engineering change proposals to CASS  
to meet Navy, Marine Corps, and other service requirements. [This  
task appeared in the 1994 catalog as IDA-29.]

**Classification:** Unclassified

**Sponsor:** OSD(P&L)  
Room 2B322, The Pentagon  
Washington, DC 20301  
Mr. Martin Meth (703) 697-1366

**Performer:** IDA  
Dr. Dan Levine (703) 845-2562  
Mr. Waynard C. Devers (703) 845-2252

**Resources:** Dollars: \$450,000  
Staff-years: 3

**Schedule:** Start: March 1994  
End: June 1995

**Data Base:** None

**Publications:** TBD

**Category:** I.A.1

**Keywords:** Government, Analysis, Electronics/Avionics, Operations and  
Support, Automation, Economic Analysis, Study



**Title:** Improved Methodologies for Relating Flying-Hour Activity to Operational Readiness and Safety Measures

**Summary:** Use econometric techniques to develop equations predicting aircrew performance from information on how many hours aircrews have flown and how much training they have received in simulators. This is a step toward measuring the cost of maintaining aircrew proficiency. [This task appeared in the 1994 catalog as IDA-30.]

**Classification:** Unclassified

**Sponsor:** OUSD(P&R)  
Room 1C757, The Pentagon  
Washington, DC 20301

Mr. John Walsh (703) 695-1760

**Performer:** IDA

Mr. Stanley A. Horowitz (703) 845-2450  
Dr. Colin P. Hammon (703) 451-2561

**Resources:** Dollars: \$935,000  
Staff-years: 6.7

**Schedule:** Start: June 1987  
End: September 1994

**Data Base:** Description: Carrier landing grades and flying experience; bombing accuracy and flying experience; air-to-air performance and flying experience; cargo aircraft drop scores, flying experience, and simulator experience; helicopter accidents, flying experience and simulator experience, maritime patrol aircraft exercise results.

Automation: Floppies or hard disk

***Publications:*** "Relating Flying-Hour Activity to the Performance of Aircrews: A Progress Report," IDA Paper P-2085, S. A. Horowitz, C. S. Hammon and P. R. Palmer, December 1987, Unclassified  
"Flying Hours and Aircrew Performance," IDA Paper P-2379, C. P. Hammon and S. A. Horowitz, October 1990, Unclassified  
"Relating Flying to Aircrew Performance: Evidence for Attack and Transport Missions," IDA Paper P-2609, C. P. Hammon and S. A. Horowitz, June 1992, Unclassified

***Category:*** II.C

***Keywords:*** Government, Estimating, Analysis, Aircraft, Helicopters, Manpower/Personnel, Operations and Support, Training, Readiness, Economic Analysis, Statistics/Regression, Data Base, Method

**Title:** Tactical Air Force Deployments to Distant Areas

**Summary:** Examine the ability of the Air Force to deploy tactical forces to locations around the world. Considerable attention is paid to the infrastructure available at airfields. In cases where the airfields are too austere to support tactical operations, bare base enhancement assets will have to be used to improve them. The adequacy of existing assets to support operations in a wide range of notional and real scenarios is central to this study. The costs of alternative ways of achieving deployability are examined. [This task appeared in the 1994 catalog as IDA-31.]

**Classification:** Unclassified

**Sponsor:** OD(PA&E)  
The Pentagon, Room 2C281  
Washington, DC 20301  
Mr. Mark Mohler (703) 697-9142

**Performer:** IDA  
Washington, DC 20301  
Mr. Stanley A. Horowitz (703) 845-2450  
Mr. W. C. Devers (703) 845-2252  
Dr. Lee Dymond (301) 340-9162

**Resources:** Dollars: \$250,000  
Staff-years: 1.7

**Schedule:** Start: June 1993  
End: September 1994

**Data Base:** Airfields: Name, location, operating characteristics,  
infrastructure characteristics  
Automation: Floppies or hard disk

**Publications:** "Air Force Deployments to Austere Locations," IDA Paper P-2004, S. A. Horowitz, L. Dymond, and W. C. Devers, Sept., 1994.

**Category:**

**Keywords:** Government, Analysis, Forces, Aircraft, Infrastructure, Operations and Support, Readiness, Economic Analysis, Data Base, Study

**Title:** Evaluation of Uniformed Services Treatment Facilities

**Summary:** The primary objective of this task is a cost-effectiveness analysis of the Managed Care Plan (MCP) available at Uniformed Services Treatment Facilities (USTFs). The DoD has a contract with each USTF to provide health care at a capitated rate based on the sex and age group of the beneficiaries served. The cost of each plan is being compared to the alternative that the MCP is terminated and the USTFs become standard CHAMPUS providers.

**Classification:** Unclassified

**Sponsor:** OASD (HA/HSF), Room 1B657, The Pentagon

Mr. Gunther J. Zimmerman (703) 697-8975

**Performer:** IDA

Dr. Philip M. Lurie (703) 845-2118

**Resources:** Dollars: Staff-years:

FY 1995 \$400,000 2.5

**Schedule:** Start: February 1995

End: December 1995

**Data Base:** Survey responses to utilization of and satisfaction with health care provided at USTFs.

**Publications:** Final report describing evaluation results due at end of project.

**Category:** II.A.1, II.A.2, II.B

**Keywords:** Government, Analysis, Policy, Manpower/Personnel, Test and Evaluation, Variable Costs, Data Collection, Survey, Mathematical Modeling, Economic Analysis, Data Base, Study

**Title:** Cost Analysis Education

**Summary:** IDA collaborated with George Mason University in the development and conduct of a graduate level course in cost analysis during the 1992–1993, 1993–1994 and 1994-1995 terms. Course content focused on the daily problems confronted by defense cost analysts and approaches to solve them. At the request of George Mason University, IDA will provide classroom lectures for this course again during the 1995-1996 term. This project supports the development of lecture materials by IDA cost analysts. [This task appeared in the 1994 catalog as IDA-38.]

**Classification:** Unclassified

**Sponsor:** IDA Central Research Program

**Performer:** IDA

Dr. Stephen Balut (703) 845-2527

**Resources:** Dollars: \$25,000

Staff-years: .3

**Schedule:** Start: October 1994

End: May 1995

**Data Base:** None

**Publications:** None

**Category:** II.A.1

**Keywords:** Government, Analysis, Forces, Weapon Systems, Life Cycle, Case Study, Review

**Title:** IDA Cost Research Symposium

**Summary:** IDA conducts a cost research symposium to facilitate the exchange of information on cost research that is in progress and planned, thereby avoiding wasteful duplication of effort and providing for more informed research planning decisions by participating offices. The Chairman, OSD CAIG, cosponsors this symposium. The 1995 symposium will focus on the DoD Six Year Cost Research Plan and the actions needed to update it. Documentation of the symposium includes a catalog of cost research projects recently completed or still in progress at participating offices. [This task appeared in the 1994 catalog as IDA-39.]

**Classification:** Unclassified

**Sponsor:** IDA Central Research Program  
OD(PA&E)

**Performer:** IDA  
Dr. Stephen J. Balut (703) 845-2527

**Resources:** Dollars: \$45,000  
Staff-years: .3

**Schedule:** Start: October 1994  
End: September 1995

**Data Base:** DoD Cost Research Projects  
Description: One-page summary descriptions of cost research projects (an example is this page)  
Automation: None

**Publications:** "The 1995 IDA Cost Research Symposium," Stephen J. Balut, August 1995, Unclassified, Pending

**Category:** II.A.1

**Keywords:** Government, Reviewing/Monitoring, Forces, Weapon Systems, Life Cycle, Data Collection, Data Base

**Title:** Energy Management Analysis

**Summary:** This objective of this project is to estimate the potential costs and savings of various energy conservation investments and practices. The focus of the project is industrial process energy consumption in the DoD. We are using data of energy savings reported by private sector industrial plants and applying these savings to similar DoD industrial plants. The savings data were supplied by the Department of Energy. [This task appeared in the 1994 catalog as IDA-41.]

**Classification:** Unclassified

**Sponsor:** OSD(P&L)  
Room 1D760, The Pentagon  
Washington, DC 20301  
Mr. Millard Carr (202) 697-4589

**Performer:** IDA  
Dr. Thomas Frazier (703) 845-2132  
Mr. Dan Utech (703) 845-2243

<b>Resources:</b>	Dollars	Staff-Years
FY 92	142,600	1
FY 94	70,000	.5

**Schedule:** Start: June 1992  
End: Continuing

**Data Base:** Not Automated

**Publications:** TBD

**Category:** II.B

**Keywords:** Government, Estimating, Infrastructure, Operations and Support, Economic Analysis, Study

**Title:** Environmental Costing Resources in the Department of Defense

**Summary:** This project continues to develop a catalog of environmental cost groups within the DoD and the Services and a summary of DoD environmental costing capabilities. An overview of the effect of environmental regulations on life cycle cost analysis is also examined. [This task appeared in the 1994 catalog as IDA-42.]

**Classification:** Unclassified

**Sponsor:** IDA Central Research Project

**Performer:** IDA  
Ms. Kathryn L. Wilson

**Resources:** Dollars: \$25,000  
Staff-years:

**Schedule:** Start: October 1994  
End: September 1995

**Data Base:** TBD

**Publications:** TBD

**Category:** I.C

**Keywords:** Government, Reviewing/Monitoring, Life Cycle, Environment, Survey, Data Base, Review



**Title:** Coast Guard Models

**Summary:** Analyze the Coast Guard's needs for cost models to support the full spectrum of its cost-estimating needs. Survey the staff of Coast Guard headquarters and examine governing federal and Department of Transportation requirements to develop a statement of cost-modeling requirements. Develop a cost estimating framework that provides a standard Coast Guard structure. Develop a Handbook of standard Coast Guard cost-estimating relationships referencing relevant Department of Transportation and Coast Guard directives. Design, prototype, and develop a cost model that meets the Coast Guard's requirements for developing cost estimates for Planning Proposals prepared by field activities.[This task appeared in the 1994 catalog as IDA-43.]

**Classification:** Unclassified

**Sponsor:** U.S. Coast Guard Research and Development Center  
1082 Shennecossett Road  
Groton, CT

Mr. Clark Prichett (203) 441-2653

**Performer:** IDA

Mr. James L. Wilson (703) 845-2469

<b>Resources:</b>	<b>Dollars:</b>	<b>Staff-Years</b>
FY 93	\$10,000	.1
FY 94	\$75,000	.5
FY 95	\$280,000	1.8

**Schedule:** Start: July 1993  
End: September 1996

**Data Base:** None

**Publications:**

**Category:** II.C, II.D

**Keywords:** Government, Estimating, Life Cycle, Fixed Costs, Variable Costs, Computer Model

**Title:** Reserve Component Volunteerism

**Summary:** This work is designed to develop an understanding of the need to have members of the reserve components available to pursue combat or non-combat scenarios in circumstances that are unlikely to involve involuntary activation of reserve personnel. It will evaluate the extent to which it is necessary to have pre-identified individuals or units that are known to be available on a voluntary basis in these circumstances. It will also develop policies to support such a program of reserve volunteerism if one is determined to be needed. The potential cost of these policies will be examined. [This task appeared in the 1994 catalog as IDA-44.]

**Classification:** Unclassified

**Sponsor:** Assistant Secretary of Defense (Reserve Affairs)  
Room 2E515, The Pentagon  
Washington, DC 20301

Col. Michael Angelo (703) 697-0739

**Performer:** IDA

Mr. Stanley A. Horowitz (703) 845-2469

**Resources:** Dollars: \$250,000

Staff-Years: 2.0

**Schedule:** Start: April 1994

End: November 1995

**Data Base:** Categorization of requirements for reserve volunteers by type of contingency, type of unit, and military specialty personnel.

Automation: Microcomputer floppy disks

**Publications:** None

**Category:**

**Keywords:** Government, Analysis, Policy, Manpower/Personnel, Labor, Readiness, Data Collection, Data Base, Study

**Title:** Methods to Assess Schedules for the Strategic Defense System

**Summary:** The objective of this task is to develop methods for assessing the acquisition schedules of ballistic missile defense systems. The systems include space-based surveillance and interceptor systems, surface-based interceptor systems and other surface-based elements.

**Classification:** Unclassified

**Sponsor:** BMDO/PDE, Room 1E1037, The Pentagon  
Mr. James Dryden (703) 412-1067

**Performer:** IDA  
Mr. Bruce Harmon (703) 845-2510

**Resources:**

	Dollars:	Staff-Years
FY 95	\$50,000	.4

**Schedule:** Start: January 1991  
End: September 1995

**Data Base:** Description: Schedule and Characteristic data on 26 unmanned spacecraft, 22 missile and 51 software programs  
Automation: None

**Publications:** Assessing Acquisition Schedules for Unmanned Spacecraft, IDA Paper P-2766  
  
Schedule Assessment Methods for Surface-Launched Interceptors, IDA Paper P-3014

**Category:** I.B.2, II.A.2

**Keywords:** Schedule, Estimating, Method, Statistics/Regression, Space Systems, Missiles, EMD, Production

**Title:** The Costs of Collocating Wargaming and Simulation Centers

**Summary:** The purpose of this task is to estimate the savings that might result from collocating two joint training and simulation centers in the Norfolk, VA. area: the Joint Warfighting Center in Hampton, and the Joint Training, Analysis and Simulation Center in Suffolk.

**Classification:** Unclassified

**Sponsor:** OSD(P&R), Room 3B930, The Pentagon

Mr. John J. Walsh (703) 695-1760

**Performer:** IDA  
Dr. Daniel B. Levine (703) 845-2562

<b>Resources:</b>	Dollars:	Staff-Years
FY 95	\$200,000	1.3

**Schedule:** Start: April 1995  
End: March 1996

**Data Base:** Facilities, equipment, personnel, cost resources employed by the two joint training centers

**Publications:** TBD

**Category:**

**Keywords:** Government, Estimating, Facilities, Life Cycle, Economic Analysis, Study

## REFERENCES

- [1] DoD Directive 5000.4, "OSD Cost Analysis Improvement Group (CAIG)." November 24, 1992.
- [2] Balut, Stephen J., and Kathryn L. Wilson. "The IDA Cost Research Symposium." Institute for Defense Analyses, Document D-647, August 1989.
- [3] Balut, Stephen J., and Kathryn L. Wilson. "1990 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-828, August 1990.
- [4] Balut, Stephen J., and Kathryn L. Wilson. "The 1991 Cost Research Symposium." Institute for Defense Analyses, Document D-1003, July 1991.
- [5] Balut, Stephen J. "The 1992 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1204, August 1992.
- [6] Balut, Stephen J. "The 1993 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1414, August 1993.
- [7] Balut, Stephen J. "The 1994 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1569, August 1994.
- [8] Office of the Assistant Secretary of Defense (Program Analysis and Evaluation). "DoD Six-Year Cost Research Plan, FY 1993-1998." AD-B170946, 4 January 1993.
- [9] Office of the Director, Program Analysis and Evaluation. "Interim DoD Six-Year Cost Research Plan, FY 1994-99." 4 May 1993.

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12A. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited.			12B. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) <p>This document contains a catalog of cost research projects discussed at the IDA Cost Research Symposium held on 25 May 1995. Participants included in the directors of offices and organizations that sponsor and conduct the research. The purpose of this annual symposium is to facilitate the exchange of research findings and other information in order to avoid wasteful duplication of effort and enhance each organization's ability to conduct research planning for the future. Each project summary included in this document presents the project title, a descriptive summary, classification, sponsor, performer, researchers, schedule, data bases, publications, keywords, and telephone numbers. The research directors report that catalogs associated with prior symposia (1989 through 1994) have been useful in facilitating the exchange of data, data sources, findings, and reports, thereby contributing to improved efficiency in the cost analysis function within the Department of Defense.</p>				
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